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TWO PAPERS

ON

FEVERS and INFECTION.

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TWO PAPERS ON FEVERS AND INFECTION.

Which were read before the

Philosophical and Medical Society,

In EDINBURGH.

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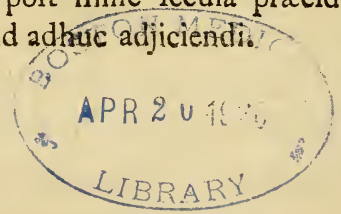
Multum egerunt qui ante nos fuerunt, ſed non peregerunt: multum adhuc reſtat operæ, multumque reſtabit; neque ulli nato poſt mille ſecula præcidetur occaſio aliquid adhuc adjiciendi. SENECA.



TWO PAPERS ON FEVERS and INFECTION.

BOSTON MEDICAL
APR 2

PAPER I.

Haſlar Hoſpital, near *Portſmouth*, 5 *June*, 1761.

OF all the various diſeaſes which afflict mankind, few are more fatal, none more frequent, than the fever. A Diſſertation on this malady, but more particularly on the means by which it is propagated, and conveyed from cauſes hidden, and too frequently unſuſpected, I propoſe as the ſubject of the following ſheets.

A very extenſive practice in fevers during three years, in one of the firſt hoſpitals in Europe, qualifies me, in ſome meaſure, for making reſearches into the dark and abſtruſe

ſubject of *infection*. The reading of what has hitherto been publiſhed, has induced me to write my own ſentiments upon it; and chiefly with an intention, to ſelect from a *Chaos* of contradictory precepts, the moſt proper, ſimple, and effectual means of protecting particular perſons, as well as guarding the community in general, from this contagion. But as a good foundation is neceſſary to a ſolid ſtructure, ſo it is requiſite that I begin with hiſtorical facts, which your excellent plan admits as the only baſis of all phyſical diſquiſitions.

After my firſt coming to this hoſpital in June 1758. I obſerved, that the men in the large ſhips of the fleet were generally healthy, but that ſeveral of the ſmaller veſſels were infected. The ſick who were ſent on ſhore, particularly from the *Saltaſh Sloop*, *Richmond Frigate*, and *Infernal Bomb Veſſel*, notwithſtanding the ſmall number of their *complement*, laboured under fevers of the moſt malignant kind.

The *Revenge* and *Montague* about this time arrived from the *Mediterranean*, the crew of the former being in a very ſickly condition. By ſmoking this ſhip well with the vapour of tar, the infection had abated, about a month before her engagement, on the

the 28th of *February*, with the *Orpheus*. But ſome ſeeds of the contagion remaining undeſtroyed, the company was again attacked with fevers; and ſome of them conveyed the diſtemper into the *Foudroyant* and *Orpheus*, prizes taken from the *French*.

The people in the guardſhips at *Spithead* were healthy, till the latter end of *July*, or the beginning of *Auguſt*, when a large draught of men, who arrived in tainted veſſels from *Ireland*, communicated an infection to thoſe ſhips, by the cloaths, and other moveables received from their tenders.

Thoſe who were on board the *Saltaſh* were ſeized with a fever, which ſeemed nearly to reſemble that jail diſtemper, of which *Dr. Pringle* has given an excellent account; and *out* of her ſmall complement of 120 perſons, above 80 were infected with a contagion, much more virulent and dangerous, than that in the guard-ſhips, or any other veſſels, during that time at *Spithead*.

In the months of *July* and *Auguſt* 1758. when the men in the ſhips which had lately arrived from the *Mediterranean*, together with thoſe in ſome ſmaller veſſels, were diſtreſſed with fevers; the ſcurvy prevailed in the grand fleet under the command of *Lord*

Anſon, and in the detachment from it under *Lord Howe*. It raged moſtly in the larger ſhips. From thoſe fleets upwards of 400 ſick were ſent to the hoſpital, the greater part of whom were highly ſcorbutic; none of them had fevers.

In the months of *September* and *October*, after the reduction of *Louisburg*, the *North American* ſhips arrived at *Spithead*; ſeveral of which were infected with a malignant fever. The ſcurvy was likewiſe ſuperadded to this diſtreſs; and thoſe of a ſcorbutic habit being ſeized with the fever, was a proof of its proceeding intirely from infection. For I have found, that the ſcurvy is a diſeaſe in its nature oppoſite to that of a fever; inſomuch that even an infection is long reſiſted by a ſcorbutic habit.

It is remarkable, that ſince the commencement of the preſent war, the greateſt number of patients, and thoſe who, in this hoſpital, were afflicted with fevers of the worſt kind, came from *North America*. The fever brought from thence this year went commonly under the denomination of the *yellow fever*, from the ſick afflicted with it often becoming yellow. In the months of *September*, *October*, and *November*, about 300 patients, with either this fever, or the ſcurvy, were

were received into this hoſpital from the *North American* fleet; and of theſe 28 died.

In the beginning of the year 1759. when the infected veſſels were properly purified, and their men free from fevers, as were likewiſe the other men in the fleet at home; the *Conqueror* and *Edgar*, two new ſhips of the line, and aftewards the *Temple*, arrived at *Spithead*. They had been manned partly with preſt people from the *Princeſs Royal* at the *Nore*, and from jails. By draughts from their crews an infection was communicated to the *Royal Anne* guardſhip, and to the *Reſolution* then fitting out at *Portſmouth*.

The fever, which raged in all thoſe ſhips, grealy affected the breaſt. Some who were ſeized with it (as if they had been under a ſalivation,) ſpit up ſix or eight pints of a thin phlegm in 48 hours; and, to prevent ſuffocation, were obliged to have their heads ſupported by pillows. Their blood was extremely viſcid and glutinous. This I obſerved, even during the laſt ſtage, in a perſon from whom it was then neceſſary to take blood for a ſtitch, greatly impeding reſpiration. In this malady the head became affected often with a heavineſs, and dull ſenſe of pain, ſeldom with a *delirium*. Cough, ſpitting, and lancinating ſtitches thro' the

the cheſt, were the moſt univerſal complaints. Some, to outward appearance, as alſo by their own account, were quite well; but their pulſe was found to be quickened, their tongue foul, and when raiſed from the pillow, they complained that their heads were giddy.

The attack of this *infection* began with ſhiverings, ſucceeded either by pain of the head or breaſt; ſeldom by an univerſal pain in the limbs, but moſt frequently by a tightneſs of the breaſt, and cough; which laſt raiſed the acute pains in the cheſt. — Several who recovered, were afterwards diſtreſſed with a dulneſs of hearing; — many relapſed. — A midſhipman, after being able to ſit up for ſome days, fell again into the fever, which was accompanied with convulſions, and expired in 30 hours after the laſt attack, when his body was found covered with *Petechiæ* *. A few died conſumptive, being exhauſted by the vaſt diſcharge in ſpitting. In four or five perſons there were ſymptoms of malignity in their ſickneſs; and out of above a hundred patients received into the hoſpital from thoſe ſhips, eight died of the fever. This diſtemper, if it had occurred elſewhere than in the ſhips, might perhaps have been judged ſolely inflammatory, and to have proceeded from cauſes very different from the real one.

* This term, as here uſed, is explained in Paper 2.

The

The *Edgar* ſailed ſoon after for the *Mediterranean*, where the contagion in a few months acquiring great vigour, together with a ſuperadded ſcurvy, deſtroyed ſixty of her men. The manner in which this ſhip became free from the infection, though not unuſual, is worth relating. In the engagement, which happened that year with the *French* fleet, on the coaſt of *Portugal*, the quantity of gunpowder, fired on board her during the action, was 25 barrels; and to the ſurprize of the officers, none of her men were afterwards attacked with fevers.

But to return to what paſſed in the fleet at *Spithead*. In the ſame year, towards the latter end of *April*, the *Melampe* arrived there, having a diſtemper amongſt the men, of which the ſurgeon gave the following account. —— That, upon receiving two perſons from the *Princeſs Royal*, a guardſhip, many of the crew were ſeized with fevers, which appeared to be of the intermittent kind; and, having adminiſtered to them the bark in large quantities, he had not loſt one patient.

On *April* the 27th, twenty perſons in fevers were received from this ſhip, and more ſick were daily ſent, in all to the number of 42.

Thoſe

Thoſe patients had been ſeized at once, when in a ſtate of perfect health, with a ſevere trembling, upon which enſued pains in the head; and often (to make uſe of their own expreſſion) in all their bones alſo. Some had, two or three times in 24 hours, a return of a ſhivering, which reſembled the fit of an ague. A few were attacked with it once every day; others every other day, in the form of a *regular tertian*. With many this cold fit continued for four or ſix hours; the partial ſweats which ſucceeded it afforded no benefit; and even a more profuſe evacuation in that way gave but ſmall relief. The pulſe commonly beat quick, and was low.—Moſt of thoſe patients had been blooded on board their ſhip; but none of them after they came on ſhore to this hoſpital, as their breaſt was altogether unaffected, and their fever much lower than that which formerly afflicted the people belonging to the *Conqueror*, and the other ſhips already mentioned.

We obſerved the natural *criſis* of this infection to be ſometimes by ſtool; and when a purging came on, the patient was immediately reſtored to health. But the recovery of the greateſt part of them was owing to blifters, and the effect of theſe was both ſurpriſing

" uſual. The pulſe always quick, ſeldom
" full or ſtrong. The tongue, for the moſt
" part, foul. The urine varying, but often
" yellowiſh. — The blood taken from a ma-
" rine, reſembles that of the *Spaniard* before-
" mentioned, is viſcid and glutinous; both
" the *gluten* and the *ſerum* being yellow, as
" is the colour of the patient. — It having
" been remarked, that bliſters have pro-
" duced not only the moſt ſalutary effect in
" removing the fever, but that ſuch as re-
" covered, without their having been ap-
" plied, were ſubject afterwards to a giddi-
" neſs, and pain in the head; it hath lately
" become a general practice to bliſter all who
" have the leaſt ſymptom of this infection,
" and thoſe complaints are no more heard of.
" The diſcharge from the bliſters ſeems like-
" wiſe to aſſiſt in preventing a relapſe.

" 10th *December*. The early application of
" a bliſtering plaſter cauſes often a ſudden and
" entire abatement of the head-ach and fever.
" In the more advanced ſtages of the malady,
" bliſters produce no bad effects; on the
" contrary, they often give the greateſt re-
" lief, though not ſo immediately as in the
" firſt ſtage of this diſtemper. During the
" courſe of the diſtreſs, ſome have a ten-

" dency to looſe ſtools, others a ſevere pur-
" ging *; but, after the application of a
" bliſter,

* In this complicated ſtate of the fever, with a flux, an ounce and half of a ſtrong decoction of bark and ſnake-root was given every four hours, with the addition of five drops of the Thebaic tincture. I have, in the ſame circumſtances, exhibited alſo antimonial medicines in ſmall doſes, with a view to abate the fever; but ſo combined with opiates, as to prevent their ruffling the bowels. Upon the decline of this fever, the danger from the flux became leſs; and I have, with pleaſure, obſerved both methods ſometimes ſucceſsful in removing the fever and flux at once. The former practice hath already been recommended by my good friend Dr. *Whytt*, (ſee obſervations on the diſeaſes of the army, by Doctor *Pringle*, edit. 3. p. 245.) And I am informed, that in the autumnal fluxes of hot countries, the like method of treatment, after proper evacuations, hath alſo been experienced ſucceſsful. Such fluxes as continued obſtinate, after the receſs of the fever, we generally ſtopped by ſmall doſes of Ipecacoanha.

Here it may not be unuſeful for young practitioners, to have it remarked; that in many fevers, where the diſtreſs or pain is fixed and permanent, topical applications will oftentimes afford more immediate relief, than medicines taken into the ſtomach, or applied at a diſtance from the part affected; in like manner as a vomiting and hiccough, that have reſiſted the effects of opium, muſk, and other powerful medicines, taken into the ſtomach, are often inſtantly ſtopped by a warm, ſpirituous, or camphorated application outwardly to the ſtomach. Thus opium in clyſters will ſometimes afford more immediate relief in fluxes, and ſome other inteſtinal

" bliſter, theſe complaints frequently become " at leaſt milder. The ſtate of the belly is " carefully attended to, as a lax ſtate of it is " judged to be certainly the moſt eligible in " all infectious diſorders. Internal medicines " have been duly adminiſtered, more parti- " cularly boluſes † of camphire with vinegar " whey,

teſtinal maladies, than when adminiſtered in any other manner; and in the ſame form, I have often given *ſpiritus æthereus*, wine, bark, &c.

Cupping and bliſtering ſhould be uſed upon the trunk of the body and limbs, on, or as near as poſſible to, the parts affected with a fixed pain; as alſo, in many caſes, blood ſhould be taken from the veſſels neareſt to the ſeat of the complaint.

† In this hoſpital, as ſoon as a patient in a fever was admitted, and put to bed, and when no immediate indication for making evacuations, or for altering the common method, preſented itſelf, it was our conſtant practice, to give him four or five grains of camphire every four hours, waſhed down with a draught of vinegar whey. The camphire, being diſſolved in mucilage of gum arabic, generally ſat eaſy upon the ſtomach; and I eſteem it a proper medicine in ſuch caſes. Another medicine much uſed, together with camphire, eſpecially in fevers of a bad kind, was the following:

℞. Rad. ſerpentar. virg. contuſ. dr. vi. aceti. lib. ij. coque ut ſit una libra colaturæ, cui adde aq. alexeter ſpir. ſyr. e corticib. aurantior, ana unc. ij. Of this the patient took two ſpoonfuls every four hours. It was, however, ſeldom preſcribed by itſelf, but with an ad-

" whey, often the bark, wine, &c. and, in " the yellow ſtate, the neutral ſaline draughts, " either with thebaic tincture, or rhubarb, " according to the ſtate of the body. But " we eſteem many of thoſe internal medi- " cines, as alſo bleeding, which I have ſel- " dom preſcribed, as only temporary, or but " auxiliary means of ſafety, in reſpect of the " benefit from bliſtering. An emetic, given " on the firſt appearance of a relapſe, often " produces the happy effect of preventing a " return of the diſtemper.

" *December* 12. Although the weather be " extremely cold with an intenſe hard froſt, " which has continued many days; yet from

dition (to the above proportion) of ſal cornu cervi dr. iij. vel ſpiritus ejuſdem unc. 1 ſs. And ſometimes the acid of the vinegar was almoſt neutraliſed with crabs eyes or chalk.

Having frequently obſerved the attack of intermittent fevers, to be prevented by a draught of vegetable acid and *alcali*, (ſuch as vinegar and powder of crabs eyes) taken in a ſtate of fermentation on its approach, I am apt to think, that there is a much greater febrifuge virtue in ſuch draughts, exhibited when in a fermenting ſtate, than in a ſtate of perfect quiet and ſaturation.

To a pound of this decoction of ſnake-root were added occaſionally, tinct. cort. Peruv. ſimp. unc. iv. vel pulv. ſubt. cort. Peruv. unc. ſs. vel vin. croc. unc. 1 ſs. And on ſome occaſions elix. paregor. unc. 1.

" the

" the *Neptune*, *Princeſs Amelia*, and other " infected ſhips, they continue daily to ſend " patients in this fever; ſome of them be- " ſprinkled with numerous *petechiæ*. Thus, " the ſeverity and coldneſs of the ſeaſon do " not ſtop, nor even check, the contagion in " thoſe ſhips."

But I now reſume the hiſtorical narrative of our other occurrences.

On *December* the 14th, when viſiting in a fever-ward, I was ſurprized to find three patients, who came from the *Cambridge*, whoſe company I ſuppoſed to be healthy. According to my uſual method, I began with interrogating thoſe patients concerning the ſtate of their ſhip, in point of healthfulneſs; and what they might imagine to have been the original cauſe of their own illneſs. Their anſwer implied, — that ſix hundred and fifty men, who compoſed the *complement* of the *Cambridge*, had enjoyed a good ſtate of health for a long time paſt; and until they, with ſome others of their ſhipmates, were ordered on board the *Neptune*, to prepare that ſhip for the dock, which was then in great diſtreſs for want of hands, moſt of her people being at the hoſpitals.

Of

Of thoſe three men belonging to the *Cambridge*, one, on the fifth day of the fever, became ſpotted, and died; another narrowly eſcaped with life; and I have reaſon to believe, that their other ſhipmates, who were employed in the *Neptune*, conveyed the diſtemper to the *Cambridge*, as ſhe ſoon after ſent to the hoſpital ſeveral afflicted with the ſame fever.

I would have it here obſerved,—That when thoſe men from the *Cambridge*, (one of the moſt healthy ſhips then in the fleet) became infected, their infection did not proceed from any perſon being ſick in the *Neptune*. For upon the firſt complaint, or the appearance of any man being there taken ill, he was immediately put to the hoſpital. And the ſame is to be obſerved, with reſpect to the numerous infected patients, who were daily ſent for five or ſix weeks, from the *North American* ſhips; that is, from the time of their arrival at *Spithead*, till that of their purification in the dock. During this period, no ſick man was kept for an hour on board any of them, if the weather did permit to ſend him on ſhore.

Thus, though the ſick with the fever were removed into the hoſpitals, yet ſtill the pernicious ſource of infection continued to be as active as ever in the ſhips.

Further,

Further, it was at this time very remarkable, that no ſeamen, belonging to any other, but the *North American* ſhips, were ſeized in this hoſpital with that fever; notwithſtanding the utmoſt precaution did not prevent their too frequent communication.

Beſides, in thoſe ſhips where there were no ſick people on board, it was plain the infection could not proceed from a foul air, or want of attention in waſhing and keeping them clean. They were furniſhed with ventilators; and I have it from good authority, that the *Neptune*, where the men were moſt ſickly, as alſo the *Dublin*, were kept uncommonly clean and neat. The former being a ſecond-rate, a prodigious draught of air muſt have been admitted from her having three tier of ports; and when thoſe ports were open, (which was all the time ſhe lay at *Spithead*, and in *Portſmouth Harbour*, while the contagion was ſo violent) the ventilation and renewal of the air exceeded what could be effected in moſt other places, in an hoſpital, or in any chamber, by open doors and windows. The diet of the people was, at that time, freſh beef and broth, with greens.

I have enquired particularly into the condition of the apartment in the *Neptune* for the

the ſick, while ſhe was at ſea; and find it was on the lower gun-deck, and to have been both ſpacious and neat. In it were cut two ſcuttles for the admiſſion of freſh air, and theſe were at all times kept open. The adjoining ports were alſo thrown up, when it could ſafely be done, though the freſh air, admitted by the two ſcuttles, was ſufficient to keep the place at all times ſweet, and free from any bad ſcent. It was waſhed twice a week with warm vinegar, beſides being duly cleaned out every day.

Sir *Charles Saunders*, who commanded the fleet, was on board this ſhip, and ſpared no method to have the apartment for the ſick, the whole ſhip, together with the men, kept wholeſome and clean.

The practice of cleanlineſs, and the benefit of the freſheſt air, did not however avail to remove this contagion; which continued till the ſhip was taken into dock, and properly purified by fire and ſmoke. After this operation, the ſhip and crew became perfectly healthy. This was the caſe likewiſe with all the infected *North American* ſhips.

But to proceed. Towards the latter end of *December*, the *Diana Frigate* arrived from *North America*. When ſhe left that part of the

priſing and ſudden. I have more than once in an evening ordered eight or ten to be bliſtered, and have left them with a quick pulſe, great heat, immoderate thirſt, a pain, confuſion and heavineſs of the head; and what to a phyſician, converſant with ſuch fevers, communicates a moſt certain knowledge of the condition of the patient, ſuch a lifeleſs ſunk ſtate of the eyes as denoted great danger *. But next morning I found theſe patients with a lively briſk eye, a calm pulſe, and with a deſire to get out of bed. Of thoſe 42 infected men, though many relapſed, yet not one died.

The *Portmahon* was the next ſhip that brought an infection to *Spithead*, from among a draught of preſt men from *Scotland*. The contagion was quickly conveyed by them into the *Royal Anne* guardſhip, notwithſtanding all ſuch as appeared ſickly were ſent to the hoſpitals.

* When viſiting a ward, containing 20 patients in fevers, at *Haſlar* hoſpital, where no curtains are hung about the beds, one may at firſt view diſcover the moſt dangerous caſes.

There is ſomewhat to be obſerved in the eyes, and their motions, which cannot be deſcribed, and yet indicates the preſent condition of the patient, (if he is not at that time juſt rouſed from ſleep) more perhaps than any one other ſymptom, ſingly taken into conſideration.

In *October* we received 24 of thoſe patients, the reſt being ſent to the hoſpital-ſhip. One of them died of the fever, another of a flux, and a third of a conſumption after his illneſs. Several were afflicted with a ſevere cough, on which account they were frequently bled, and their blood abounded with *Gluten*. In the beginning of this fever, a profuſe bleeding from the noſe was uſual, and relieved the head much, which was always affected.

The diſtemper abated, chiefly by the uſe of bliſters, on the ſecond, third, fourth, or any other day of the fever, reckoning from its firſt attack. In four patients, with whom the bliſters proved ineffectual, the head-ach and *delirium* were in a few hours removed by *antimonial* medicines. Relapſes were, as in ſimilar infections, frequent. *Petechiæ* appeared on ſome of thoſe men, who were ſent to the hoſpital-ſhip. This was indeed judged, and with good reaſon, to be a fever of a bad and malignant kind; and, what was very ſhocking, a great many of the patients from the *Portmahon*, whom I viſited, had never changed their cloaths from the time they were preſſed in *June*, to the 22d of *October*, when they came to the hoſpital. The unſhifted linen and rags, which they had lain in for above

above four months, were ſufficient to have bred an infection.

In this month of *October* the ſquadron arrived from the *Weſt Indies*, after the reduction of *Guadalupe*, ſo over-run with the ſcurvy, that, when in the channel, ten or a dozen perſons uſually died of it every day. Out of three hundred and fifty ſcorbutic patients, who were ſent a-ſhore from thoſe ſhips, there was not one who had a fever. This I mention for the ſake of the following remark.

The ſurgeon of the *Panther* told me, that forty of her men had died of the ſcurvy in their paſſage home; and, during that time, there were uſually ninety patients in the ſick apartment. This place, appropriated for the diſeaſed, was in the *bay* of the ſhip, and had no pipe from the ventilator, nor any ſcuttles cut through its ſides, for the admiſſion of the freſh air. A number of patients, thus cloſely crowded together, rendered the place ſo diſagreeable and ſuffocating, that the ſick were in a manner ſtifled for want of air. The ſurgeon, when viſiting the diſtreſſed, could ſcarcely breath in it, or remain with them for any length of time, without being obliged to have recourſe often to the freſh air upon deck, and ſometimes to the ſpirit of hartſhorn, or to

a glaſs of wine, for his immediate relief. He obſerved, that both the virulence and mortality of the ſcurvy were doubtleſs heightened by the unventilated air of the place, in which the diſeaſed for ſeveral weeks had been confined; yet out of above an hundred ſick ſent to the hoſpital by this ſurgeon, not one was remarked to have any ſymptom of a contagion generated in that apartment.

The firſt ſhip, which arrived towards the latter end of this year from the fleet in *North America* was the *Loeſtoffe*. On the 18th of *October* fourteen of her men were ſent to the hoſpital, and thirteen more on the 21ſt of the ſame month. The ſcurvy, the flux, and fevers, were reported to be the prevailing maladies in that ſhip.

The account given of the fever was to this effect. The company of the *Loeſtoffe* were in perfect health during the eight months they were abroad in *America*, and until a few days before their departure from *Quebec*. At that time ſix recovered marines came on board from *Point Levi* hoſpital, and in 48 hours afterwards, among her company of two hundred people, fifty were ſeized with fevers and fluxes. In ſome, the ſickneſs began with a flux, in others with a fever, but the flux was generally moderate and gentle. The fever

continued

continued commonly from five to ten days; two patients were diſtreſſed with it for a whole month. When the firſt attack was from the fever, a ſupervening flux proved ſalutary; but where the contagion made its firſt appearance with a flux, the acceſſion of the fever carried off the patient. This ſhip was twenty-ſeven days in her paſſage to *England* from *Quebec*, and during that time ſix of her men died.

A *Spaniard*, one of the *Loeſtoffe's crew*, having relapſed, turned yellow on the ſixth day of the fever. His chief complaint at this time was an univerſal uneaſineſs over his whole body, his head alone being unaffected. He earneſtly intreated to be blooded; though his pulſe was low, I conſented to his repeated ſolicitations, and permitted a ſmall quantity to be taken from his arm. I had now the firſt opportunity of inſpecting the condition of the blood in the yellow ſtate of this fever. The maſs was exceedingly viſcid and ſizy; and, after ſtanding ſome time in a proper veſſel, the grumous concretion became covered with a yellow *gluten* half an inch in thickneſs, impenetrable to the finger, unleſs cut by the nail; the *ſerum* being at the ſame time of the ordinary conſiſtence of a thin ſyrup, and of a deep yellow tinge. A perſon, prompted by curioſity, taſted this *ſerum*, and found it

- bitter.

bitter. Another perſon, not knowing it to be the *ſerum* of blood, judged it to be a compoſition of ſoot.

This fever was plainly the ſame with that which was brought laſt year from *North America*, and commonly by us denominated *the yellow fever*. It was more uſually accompanied with a flux, than the fever of the preceding year; and of the ſick ſent to this hoſpital a greater proportion died of thoſe from this ſhip, than from any other; for of thirty-four which were admitted, ſome with the flux, and others with the ſcurvy, but the greateſt number with fevers, we loſt nine patients.

In the following month of *November*, after the important conqueſt of *Quebec*, the *North American* fleet returned to *England* with ſeveral of the ſhips companies in perfect health; while the crews of others were afflicted with an active and powerful contagion.

In the number of the former, or healthy ſhips, were the *Prince Frederick*, and *Captain*; alſo the *Somerſet* and *Stirling-Caſtle*, which arrived after the others. The infected were the *Princeſs Amelia*, the *Orford*, *Shrewſbury*, *Medway*, *Dublin*, and *Neptune*. The moſt vigorous contagion had invaded the two latter. From the *Dublin* they had buried in

the

the paſſage home nineteen men; and, on their arrival at *Spithead*, they reported to the hoſpital ninety ſick in fevers, fluxes, and the ſcurvy. On board the *Neptune* the mortality had been much greater, for it was ſaid, that ſhe had loſt one hundred and ſixty of her men in a few months, and her report contained one hundred and thirty-three ſick. The ſurgeon had been ſeized with the yellow fever, but was recovered. One of his mates had the fifth relapſe into it, when at *Spithead*.

Some attributed their ſickneſs to the *French* priſoners, whom they had received on board. Others to the *New England* volunteers, who were very ſickly; and the fever was introduced into ſeveral ſhips by the marines from *Point Levi* hoſpital. Of near four hundred patients, who were attacked during the months of *November* and *December*, with the contagion in thoſe ſhips, and were brought into this hoſpital, I only loſt about twenty-ſix, who might be ſaid properly to have been deſtroyed by it. And of that number one third were nearly paſt all hopes of recovery before they were landed.

It may be now proper to give a few obſervations on this infection, as they were written at different times in the wards of thoſe patients.

" 20th

" 20th *November*. The *criſis* of this fe-
" ver happens at no fixed period, nor on any
" certain day, that can be foretold. The
" ſick recover chiefly by the diſcharge from
" bliſters *. A few had ſpots; on ſome
" they were *petechial*, moſt of whom are well;
" as alſo many of them who, in the courſe of
" the malady, became yellow. This laſt ex-
" ternal appearance is at preſent much more
" frequent than the ſpots. The tincture over
" the ſkin is univerſal, of a deep yellow tinge,
" often painful, and diſagreeable to the ſight.
" One *Aſhley* has relapſed three times, and in
" each relapſe there appeared this jaundice.
" In ſome, the ſtools, urine, and diſcharges
" from the bliſters, are of a yellow hue; but
" this is not obſerved in all. Vomiting an
" unuſual ſymptom.

" 1ſt *December*. Few in this fever coma-
" toſe. In bad caſes a ſlight *delirium* at intervals

* Several foreigners, eſpecially the *Spaniſh* phyſicians, have entertained an unreaſonable prejudice againſt veſicatories, on account of the ſevere ſtrangury ſometimes occaſioned by their application.

But this diſtreſs is for the moſt part quickly abated, by throwing up a ſpoonful or two of linſeed oil in a clyſter; or by ſwallowing a few grains of camphire and nitre, drinking plentifully of cooling and mucilaginous liquors; or even by anointing the *os pubis* with a liniment prepared with camphire.

" uſual.

the world, the company was in health; but, a few weeks before ſhe reached the coaſt of *England*, meeting with very bad weather, the men were attacked with fevers; of which the boatſwain, ſurgeon's mate, and ſome others, died. The report of this ſhip, at her arrival, contained 32 ſick of a fever, ſaid to be malignant, with a ſmall degree of infection. One man expired ſoon after being landed. All the reſt recovered their health in the hoſpital.

Thus a ſeaſoned ſound crew became infected, as it would appear, from the cloſeneſs or damp below, occaſioned by the hatchway being kept ſhut.

Another inſtance of the like kind occurred in the *Saint George*, which ſailed from *Spithead* about *February* 1760. with a healthy company; and returned, after meeting with rough tempeſtuous weather, in a ſickly condition. The ſickneſs, in both thoſe ſhips, made its firſt appearance during an intenſe cold ſeaſon, and was of a malignant nature.

Now, on board moſt other ſhips of war, we were able to trace out the importation of the contagion, either from the *Princeſs Royal*, or the other guardſhips; from jails, unſeaſoned landmen, contaminated perſons, or ſhips.

The effects of it were discovered, for the most part, in a few days, and the importers of it sufficiently known.

As, perhaps, I may continue the present plan, and transmit a particular account of the diseases, which occurred the year following; so, at present, it may suffice to remark, — That, in the beginning of the year 1760, several frigates, viz. the *Postilion*, *Liverpool*, *Repulse*, and *Niger*, brought an infection to *Spithead*, which they received from some draughts of newly impress men.

This infection was very slight. In many, its presence was known only by regular or irregular shiverings; which were often mistaken for a sudden chill or cold, and at other times for an ague. Several were subject to a return, at intervals, of those cold fits, even for three weeks after they came a-shore.

In order to the separation of these tainted persons from the other patients in the house, which at that time was pretty full, some new wards, not before inhabited, were necessarily then opened. About 20 or 25 of those who appeared to be the most healthful, and on that account received into the new apartments, were seized with fluxes. In such as died of this distemper, I found large collections of *matter* in the cavity of the lower belly;

belly; as alſo ulcerations along the external ſurface of the inteſtines, without any apparent ſign of a mortification in the parts. Their ſhip-mates, who reſided in the ſeaſoned wards, were ſeldom afflicted with the flux. Their complaints were an univerſal diſorder, pains in the limbs, ſometimes in the head; a cough and ſpitting, with recurring ſhiverings. Two of them in the fever became yellow, and both recovered. But in a ſeaſoned ward, containing 20 patients, it was uncommon to ſee more than two or three of them confined to their bed.

Although this infection was far from being virulent, and produced but in few inſtances a fixed fever, yet the number of the infected occaſioned a juſt alarm. Thoſe frigates were therefore ordered to be properly purified. And a complaint having been made of the *Princeſs Royal*, a guardſhip at the *Nore*, as a baneful ſource of ſickneſs to the fleet, that ſhip was alſo ordered to be duly cleanſed. From the execution of theſe orders, the moſt beneficial conſequences enſued.

However, from another quarter, we ſoon after received ſome infected patients. The *Garland*, a ſhip of 20 guns, arrived from *Plymouth*. In this veſſel the company had been in perfect health, till ſome of her men

were ſent to aſſiſt the *Shrewsbury*, whoſe crew was then moſtly ſick at *Plymouth* in the hoſpitals. Upon the return of thoſe men to the *Garland*, they brought along with them a ſpotted fever, which they communicated to their own company.

The patients received from this ſhip laboured under a fever of a more malignant nature, than any fever I ever had occaſion to obſerve at *Haſlar*; and their ſickneſs appeared to be the effort of a moſt violent contagion; ſo that it became neceſſary, without delay, to ſmoke and purify the whole ſhip. On the two following days after the operation, they ſent a-ſhore four ſick; and from that time this peſtilential contagion was entirely removed from the *Garland*.

In this hoſpital none of her people, who had been afflicted with that malignant fever, relapſed. This I aſcribed to their being moſt of them ſeized with the ſcurvy, while on recovery from the fever; for, at this time, an unuſual, epidemic, and real ſcurvy, prevailed over the county of *Southampton*. Its influence extended itſelf ſurpriſingly to the ſhips at *Spithead*, and to ſuch as were hovering on the coaſt. It attacked ſome hundreds of the *French* priſoners, both in *Wincheſter* and *Porcheſter* caſtles; nor were families, living

at

at their eaſe in the county, exempted from a ſlight attack; nay, ſome few perſons were afflicted with it in a high degree.

At *Haſlar* it ſeized men who were lately impreſt, and who had never been at ſea, equally with the old ſailors, and thoſe who had made ſeveral voyages to the *Eaſt* or *Weſt Indies*, and had never before been affected with it. In ſhort, it was uncommon to find a man, long confined in bed, eſpecially after a fever, altogether free from the ſcurvy in this hoſpital. But to return from this digreſſion.

I have now given a faithful account of all ſuch infectious fevers, as occurred in *Haſlar Hoſpital* from *June* 1758. to the beginning of the year 1760. Moſt of theſe particulars are known to the gentlemen who attended my viſits, and who are all now alive; as likewiſe to the officers and ſurgeons of the reſpective ſhips. Nor muſt we omit to mention a matter of leſs general obſervation, — That one man only in a ſhip ſhall ſometimes be ſeized with the petechial, and ſometimes with the yellow fever, all the reſt of the people continuing unaffected.

Of this the *Magnanime* afforded an inſtance. She was 17 weeks at ſea, and for a whole month

month of that time, during very bad and ſtormy weather, had on board thoſe men who were wounded in the general engagement on the 20th of *November*. Notwithſtanding this long continuance at ſea, and the violent ſtorms that ſhe encountered, yet of 700 men, five only were reported to us to be ſick, beſides the wounded; and theſe chiefly in chronic ailments. However, upon their landing, I found that one of them laboured under a ſpotted fever, of which he ſoon died, overſpread with petechiæ. Another perſon in the yellow fever was ſent from the *Raven ſloop*, of which he alſo died; and yet no other perſon on board of thoſe two ſhips were either before or afterwards taken ill of ſuch fevers.

I do not recollect many ſuch incidents, that have occurred in the hoſpital, although I have frequently viſited patients in fevers, ſimilar to the above-mentioned, in families where an infection was not in the leaſt ſuſpected.

But let us leave this part of the ſubject for the preſent; and, turning our eyes to a more pleaſing ſcene, take a view of the general ſtate of the fleet, in point of health, during the courſe of the years 1759. and 1760.

In the grand fleet of *England*, commanded by Sir *Edward Hawke*, who, on the 20th of *November*,

November, defeated the *French* under monſieur *Conflans*, they enjoyed a moſt perfect and unparalleled ſtate of health. This fleet is ſuppoſed, at moſt times, to have conſiſted of above twenty ſhips of the line, and ten or more frigates, in which were embarked about 14,000 people. On the day of action, many of thoſe ſhips and men had been above ſix months from *Spithead*; notwithſtanding, as I have been told, there was not then among them twenty ſick in all. Out of 880 men in the *Royal George*, (Sir *Edward Hawke's* ſhip) there was but one man who was incapable of duty. In the *Union* (Sir *Charles Hardy's* ſhip) of 770, they had likewiſe but one unfit for ſervice; and on board the *Mars*, commanded by Commodore *Young*, though a new ſhip of 64 guns, there was not a ſick perſon.

Now it was hardly ever known before, that ſhips could cruiſe in the *Bay* of *Biſcay*, much above three or four months at a time, without having their men afflicted with the ſcurvy. An exemption from that calamity was entirely owing to this fleet having been well ſupplied with freſh meat and greens.

It is an obſervation, I think, worthy of attention, — That fourteen thouſand perſons, pent up in ſhips, ſhould continue, for ſix or

ſeven

ſeven months, to enjoy a better ſtate of health upon the watery element, than it can well be imagined ſo great a number of people would enjoy, though quartered on the moſt healthful ſpot of ground perhaps in the world.

How long the health of thoſe men might have been preſerved, if their ſupply of the land productions had not been cut off, we cannot ſay, though it ſeems a matter of laudable curioſity. For, after this engagement, the victualling tranſports having been detained by contrary winds, they ſuffered a great diſtreſs for want of proviſions and water. And the commanding officers were at length reduced to circumſtances, in this reſpect, little better than the common men. Notwithſtanding, it was more than ſix weeks after the commencement of thoſe hardſhips, before the ſcurvy made its appearance among them. And though moſt of the ſhips had been abroad ſome ſeven, and others near eight months, yet they loſt very few men, and thoſe chiefly by the ſcurvy.

The *Royal George*, the capital ſhip in that fleet, ſailed from *Spithead* the 17th of *May*, 1759. and did not return till the 18th of *January* following. When ſhe left *England*, 20 of her men laboured under coughs, and other complaints, which are the uſual conſequences

quences of the irregular behaviour of ſeamen when on ſhore. A boy having brought with him the ſmall-pox on board, five of her people died of that infection; and theſe were the only perſons who died in this eight months cruiſe. Before her arrival at home, the company in general became more or leſs affected with ſcorbutic ſymptoms. And, when they got into the port, twenty, afflicted with the ſcurvy, were ſent to the hoſpitals; of whom only one man died, having had a dropſy ſome time before.

To the general ſtate of good health enjoyed by the ſhips companies in this great fleet, there were however two exceptions. Theſe occurred in the *Sandwich* and *Torbay*. The former being a new ſhip, manned with people unaccuſtomed to the ſea, and with many from the *London* jails, returned to *Spithead* towards the end of *December*, 1759. with a ſickly crew, after a long and ſeparate cruiſe from the reſt of the fleet. And I have heard, that, in the month of *June*, 1760. ſeveral patients, having a malignant fever, were ſent from the *Torbay* to the hoſpitals at *Plymouth*.

But, excluſive of the companies of thoſe two infected ſhips, I have reaſon to believe,

that there were few or none of the men employed on the coaſt of *France*, and in the *Bay* of *Biſcay*, for 18 months, (viz. from *May*, 1759. to *December* 1760.) whoſe number may be computed at fourteen thouſand at firſt, and ten thouſand afterwards, kept conſtantly in thoſe ſeas, (commonly from ſeven to eight months at a time) who were afflicted with any diſeaſe but the ſcurvy; and with that only, when not ſupplied with freſh proviſions.

We muſt except ſuch chronic complaints, as are always heard of among mariners; ſuch as rheumatic pains, old hurts, and bruiſes, with conſumptive caſes, and the like; moſt of them being the conſequence of former diſorders, or of old age, and its infirmities.

I have now finiſhed the narrative of ſuch occurrences, as was intended to ſerve for the baſis of the doctrines I now proceed to deliver.

Firſt. It appears, that the ſea air is wholeſome and ſalutary to people, who have been for ſome time accuſtomed to breathe in it, and who are ſupplied with their proper food or nouriſhment. —— And experience has further ſhewn, that perſons, when at ſea, are leſs

ſubject

ſubject to be afflicted with fevers, than thoſe who are at land *.

Obſtinate agues, and what is called the bilious cholic from being accompanied with vomitings and a purging of ſuppoſed bile, but eſpecially the flux, are often at *Portſmouth* and *Goſport*, in the autumnal ſeaſons, highly epidemical. —— Since I reſided here, I have obſerved thoſe diſtempers to rage among the inhabitants, ſtrangers, and troops, with an uncommon degree of mortality; while, during this period of univerſal diſtreſs at land, ten thouſand men, in the ſhips at *Spithead*, remained unaffected with them.

From theſe accumulated proofs, this poſition ſeems evident.——And, indeed, ſo pure and untainted is the atmoſphere at ſea, by being duly ventilated by uninterrupted breezes, and refreſhing winds, that it becomes the undoubted *aſylum* for health in ſickly climates, and during the rage of epidemical or peſtilential diſeaſes at land.

* Since this paper was read before the ſociety, ſurpriſing proofs have occurred of the ſalubrity of the ſea air, from ſeveral large ſhips, which have been out a twelvemonth, and ſome a longer time, in different ſtations on the coaſts of *France*; and whoſe men have nevertheleſs continued in an unexpected ſtate of good health.

Add to this, that the effects of a contagious malady are more clearly discovered in fleets, or in a number of different ships, than in towns or villages, as all the ships, which compose a squadron, are under the same influence of diet and of climate, the circumstances of the men being likewise in other respects for the most part similar. Hence, an infection may often spread itself unsuspected over a town or village, while in a fleet of ships its influence becomes more apparent, from its confinement to one or more ships.

Secondly. It also appears, — That fevers of various denominations, and of very different kinds, may be occasioned by a contagion; and that an infection in a village, house, prison, or in any other place, be it either imported, or there generated, does not always produce a malignant, much less a mortal fever.

To illustrate more fully the present point, let us remark what occurs in the flux, which may also be applied to the fever.

Every one knows, that the camp dysentery, and indeed most dysenteric fevers, are generally both infectious and malignant. — But I had a patient in a chronic flux of two years contiuance,

continuance, which ſeldom confined him to his bed, and yet he infected with it almoſt all perſons who uſed the ſame privy. He had been at different times, in all fifteen months, in the hoſpital at *Hallifax*, in order to obtain a relief from his malady; and he afterwards remained three months at *Haſlar*; hence he was diſcharged as incurable. This perſon was lodged in a ward with rheumatic patients, ſeveral of whom daily complained of a ſevere purging; and which they imputed to their medicines. The nurſes of the ward became affected in the like manner, who firſt diſcovered it to be owing to this patient's ſtools, which were ſlimy, and very offenſive. And, upon debarring him from the uſe of the common privy, this general complaint among them ceaſed. Caſes of a like kind have frequently occurred in this hoſpital.

But to proceed further;—— I think I have obſerved, that the propenſity of the patients to frequent relapſes into a fever, is in a degree proportional to the contagious diſpoſition of that fever; or, at leaſt, that patients relapſe more frequently into a fever taken from an infection, whether it be of a mild or more virulent nature, than into other fevers. And this circumſtance may, perhaps, ſometimes aſſiſt us in judging of the nature and cauſe of a diſtemper.

Thirdly.

Thirdly. By a fixed attention to this ſubject for ſome years paſt, I am convinced, that the body of the diſeaſed, kept exactly neat and clean, is not ſo liable to impreſs the *taint*, as his late wearing apparel, dirty linen, and uncleanlineſs of any ſort about him long retained in that impure ſtate.——I ſay, theſe laſt contain a more certain, a more concentrated, and contagious poiſon, than the newly emitted *effluvia* or excretions from the ſick.

What ſecretions do moſt readily convey the infection, and at what period of the diſeaſe, or under what circumſtances the greateſt danger may be apprehended, muſt be referred to a diſcuſſion in ſome ſubſequent paper on this ſubject. —— I ſhall at preſent only, in confirmation of what has already been advanced, relate the different caſes of the labourers, and of the nurſes at *Haſlar*.

The duty of the former was to carry up the ſick in their infected cloaths to the wards; and afterwards to bundle up, and bring away, every article of their apparel. Thoſe labourers were repeatedly infected, and with the moſt obſtinate fevers. Whereas the nurſes, who undreſt the patients (near a good fire, which was always kept in the wards), and who conſtantly attended them after they were

put

put in a clean bed, and in clean linen, were not only, in many reſpects, leſs liable to the fever; but when they did receive an infection, it was generally much milder, and ſooner removed. Several, indeed, of the nurſes who ſuffered, owed much of it to their own indiſcretion. For it was well known, that many of them, who were tainted, became ſo, by keeping the dirty linen, after it had been taken from the ſick, for ſome days in the rooms where they ſlept, contrary to the rules of the houſe. One nurſe was three times by that means infected. Theſe obſervations may ſerve to enforce to the ſick, and their attendants, the neceſſity of an exact neatneſs, and a conſtant cleanlineſs about both.

Fourthly. We are of opinion,—That, beſides the materials of wool, cotton, linen, and apparel of almoſt every ſort, the ſeeds of an infection are ſtrongly adheſive to many other ſubſtances in infected chambers, and other places. Beams of wood, as in ſhips, chairs, bedſteads, with other furniture, as alſo various utenſils uſed about the ſick, may, doubtleſs, become ſtrongly tainted with them. This hath been ſufficiently evinced from the foregoing relation of the courſe of the infection in the fleet.

Fifthly.

Fifthly. Thoſe ſeeds, more emphatically expreſſed by the *Greek* appellation Μιασματα, wherever imbibed, or to whatſoever materials they may adhere, I call the *ſource* (or, what is ſometimes underſtood among phyſicians by the *Latin* appellation *Fomes)* of an infection.—And we judge, that the malignity, the degree, and the danger, of the ſubſequent ſickneſs, or fever, will in a great meaſure depend on the quality, or the ſpecific nature of that ſource from whence it is derived. *Dr. Pringle* has given an account *, that of 23 perſons, who were employed in refitting the old tents in which ſome tainted ſick had lain, 17 died of the infection; ſo venomous muſt that ſource of poiſon have been: Whereas, on the other hand, we have ſeen the condition of the *Melampe*, and of many other ſhips, where there were undoubted proofs of an infection; and yet the fever produced by it was very mild, and in few inſtances proved fatal.

To illuſtrate this poſition more clearly, by other examples and facts, we muſt obſerve, That during the months of *January*, *February*, and *March*, *Anno* 1760. 24 patients were received from the *Garland*, moſt of whom had petechial ſpots, accompanied with other ma-

* Obſervations on the diſeaſes of the army, p. 27.

lignant

lignant ſymptoms, and five of them died of the fever. During the ſame months, one hundred and five infected perſons were ſent from the *Poſtilion*, *Liverpool*, and ſome other frigates, of whom only eight died, and thoſe moſtly of a flux, proceeding from the damp in the wards, as before related.

Now, while inſtances ſimilar to theſe frequently occur, (as plainly appears from the narrative in the former part of this paper) it ſeems altogether certain, that ſome ſhips are, (and in the like manner other places may be) more ſtrongly infected than others; or, (in a phraſe more adequate to our conceptions of the thing) they retain a more concentrated and poiſonous ſource of contagion.

I cannot preciſely ſay, that the number of the infected will be in a proportion to the virulent energy, or the ſtrength of this ſource; becauſe I have known a greater proportional number infected from a very mild contagion, than were taken ill out of the ſmall *complement* of the ſhip *Garland*, where the infection was of a very violent nature. This much I am certain, that the danger of mortality will always be proportional to the ſtrength of the poiſon. But to proceed.

Sixthly. Wherever this venom lurks, and in whatſoever materials it is harboured, the admiſſion of the pureſt air, or the moſt perfect ventilation, will often not avail, either in removing or abating its activity.

This poſition might be proved, by adding many more inſtances of the like kind to what has already been mentioned, of the *Neptune*, *Dublin*, and other infected ſhips, which were kept remarkably clean, and well aired; but I ſhall confine myſelf only to one proof more.

When ſhips are to be put into the baſon of the dock, it is uſual to remove their men out of them into *hulks* in the harbour. Theſe hulks are old ſhips, containing, as one would imagine, nothing but decayed timbers, capable of receiving or retaining infection. They may be compared to ſuch old uninhabited houſes as have the windows broken, or at leaſt at all times kept open, and where the wind, cold, and rain, have the freeſt acceſs. Not long ſince, a part of the company belonging to the *America*, having ſlept in one of thoſe hulks, I remarked ſeveral of them were afterwards ſeized with fevers of a low and bad kind; while the other part of that company, who ſlept on board their proper ſhip, were

were affected only with ſlight coughs and rheums. I have indeed frequently met with inſtances of bad fevers, which have been contracted from thoſe cold, raw hulks. It muſt be remembered, that wholeſome air, and even the ſevereſt froſt, did not mitigate the force of the contagion in the *Neptune*.

We will allow, that, under ſome circumſtances, a poiſonous *fomes* in an infected chamber, or in any other place, may be removed or deſtroyed by accidental means, for which we cannot account; and, to ſpeak the truth, what theſe are, we often know not. But it is moſt certain, that the caſe is oftener as it is here repreſented, and that an exact cleanlineſs, properly kept up in places truly infected, together with the benefit of a pure air, do often prove inſufficient to remove the evil. The unavailing efficacy of thoſe means ſometimes muſt not, however, occaſion any relaxation of the attention to them, much leſs a neglect of two ſuch important articles, that are ſo highly conducive, during every ſuch calamity, to the preſervation of the healthy, and to the recovery of the afflicted.

But if means ſo abſolutely neceſſary to prevent a contagion, and the ſpreading of it, as cleanlineſs and a pure air, do often fail in removing or annihilating its ſecret pernicious ſource; it

now gives me the higheſt ſatisfaction to acquaint my learned brethren of the ſociety,—that I ſeldom or ever knew a proper application of fire and ſmoke to be unſucceſsful in producing the happy conſequence of effectually purifying all tainted places, materials, and ſubſtances.

It is not to be doubted, but that, excepting the true plague, there has been an infection fully as peſtilential, and as mortal, in ſome ſhips, as in any other place whatever; yet I never heard of any ſhip, which, after having been carefully and properly ſmoked, did not immediately become healthy for the men. And if afterwards they turned ſickly, it was eaſy to trace that ſickneſs in perſons coming from other infected ſhips, jails, and the like places.

There are three methods commonly practiſed for purifying ſhips or veſſels, after the company has been removed out of them.

The firſt is, by burning of tobacco. A quantity of tobacco is ſpread on ſeveral fires made with ſuch old pieces of rope, as are called junk These fires diſperſed into different places of the ſhip, their heat and ſmoke is afterwards cloſely confined below for a conſiderable

ſiderable time. By this operation, the *Neptune* and *Garland* were rendered perfectly wholeſome.

The ſecond method is, by charcoal fires, ſtrewed with brimſtone. The heat and ſteam of thoſe burning materials for this purpoſe, muſt likewiſe be long and cloſe ſhut up. Although this antipeſtilential fume, properly applied, hath been experienced to purify moſt effectually all tainted apartments, ſhips, cloaths, *&c.* yet I have obſerved, that it does not deſtroy ſome ſpecies of vermin, particularly lice. From which we might be led to imagine, that contagion is not propagated from animalcules.

The third method of purification is performed, by the addition of arſenick to the materials of the ſecond proceſs, in the following manner. After carefully ſtopping up all the openings, and every ſmall crevice of the ſhip, (as was alſo neceſſary in the preceding proceſſes) a number of iron pots, properly ſecured, are to be placed in the hold, orlope, gun-deck, *&c.* Each of theſe are to contain a layer of charcoal at the bottom, then a layer of brimſtone, and ſo alternately three or four layers of each; upon which the arſenick is to be ſprinkled, and on top of it, ſome *oakum*, dipped in tar, is to be laid, to ſerve

as

as a match. The operators, upon ſetting fire to the oakum, muſt ſpeedily leave the place, ſhutting cloſe the hatchway by which they came up.

From the known and experienced efficacy of the proceſſes, which have been deſcribed, it appears, that fire and ſmoke are the moſt powerful agents for annihilating infection; and, it may be preſumed, even the plague itſelf. This is, in ſome meaſure, agreeable to what we learn from the antient records of phyſic. But the prepoſterous uſe, or rather abuſe, of fire on ſuch occaſions, hath cauſed its effects to be diſregarded by ſome, and to be ſuſpected of miſchief by others.

The modern practice of burning large fires in the open air, in the ſtreets, and about the walls of towns infected with the plague, or other contagion, is founded on principles groundleſs and erroneous; and hath therefore been experienced not only unſucceſsful, but hurtful. Might not this have proceeded from a conſumption and a deſtruction, (during the continuance of ſuch great ſpreading and univerſal fires in a populous city) of that principle in the air, which is equally the food of animal life and of fire? And would not the miſchief be ſtill greater, at a time when a copious and conſtant ſupply of freſh air, fully impreg-

impregnated with that principle of life, was ſo abſolutely neceſſary in the inner, foul, and pent-up chambers of the tainted ſick? Be that as it may, and let us freely allow, that fires in the ſtreets, and in the open air, may have proved hurtful during a prevailing contagion, it does not thence follow, that, when once a houſe hath been infected with a peſtilential, or any other fever, and the patients removed from it, the doors and windows being ſhut, that ſuch fires will then prove hurtful; or that, by this method of purification, all ſeeds of contagion will not effectually be deſtroyed. Experience, the ſureſt teſt of medical truth, has fully aſcertained the efficacy of the proceſſes which have been deſcribed.

It is therefore much to be wiſhed, for the benefit of the public, that this manner of purification might become a general and univerſal practice. Mankind need not be furniſhed with precautions againſt great and imminent dangers which they ſee, or poiſons which they know; the love of life naturally leads to ſhun them. But there is a neceſſity for guarding, by the moſt effectual meaſures, againſt ſuch ſecret means of ſickneſs and of death, as are not pointed out by the watchful inſtinct of ſelf-preſervation.

Whenever

Whenever therefore perſons die of a ſpotted fever, a malignant ſore throat, the ſmall-pox, or any diſtemper found to be communicable from the ſick to others; for the preſervation of the reſt of the family, and of the neighbourhood, the corpſe * ought, quickly after death, to be removed into another room; and that in which they died ſhould be aired, by having the windows opened, till a charcoal fire be kindled, upon which ſome rolls of ſulphur muſt be placed; and afterwards both doors and windows ſhould be kept cloſe ſhut for a conſiderable time, not leſs than eight or ten hours, and till the room be thoroughly and ſufficiently ſmoked.

I have known in ſeveral ſhips, where there are the faireſt opportunities of trying and judging things of this nature, that the contagion of the ſmall-pox has been entirely ſtopped by means of wood fires, ſprinkled with brimſtone, kept burning, and cloſely confined, in the infected place. How uſeful then muſt this knowledge prove to the inland towns of England, where the dread and havock of that diſeaſe, among grown perſons, exceed

* I judge a recent cold corpſe is not apt to communicate any taint, unleſs it be from the diſcharge of humours, which may happen from any of the outlets of the body, or from running ſores.

moſt

moſt calamities? In a word, a judicious and proper application of fire and ſmoke, is the true means appropriated for the deſtruction and utter extinction of the moſt malignant ſources of Diſeaſe. They are beſides the greateſt purifiers of all bad and tainted air; but of this I am to diſcourſe more fully in another work *.

With regard to the neceſſary precautions of defence, which are to be taken where there is infection, and while the ſick are ſtill in their chambers, I would for this purpoſe recommend chiefly the uſe of wood-fires in the apartments: For it hath been experimentally found, that the ſmoke of a wood-fire ſerves not only to leſſen the force or violence of ſuch poiſons, but is alſo an excellent protection againſt their being conveyed. Thus, when from the ſituation of the fire-place in a ſhip, ſome ſmoke is apt to be frequently occaſioned between decks, the men in her are obſerved to be more healthy.

But to confirm this poſition by more direct proofs of it. — Some years ſince, when the infection was ſo mortal in the *Royal Anne*, a guardſhip at *Spithead*, that many died of it in forty-eight hours illneſs, with a fever, and

* The ſecond edition of An eſſay on preſerving the health of ſeamen.

with violent bleedings from the nose, it was remarked, that none who slept within the reach of the smoke from the cook-room were infected. Hence it would appear, that a cold, raw, damp air increases the power and vigour of contagion *; and which is further confirmed by the following relation given by Mr. *Ramsay Kar*, formerly surgeon of the *Torbay*, and now of the dock-yard at *Portsmouth*.

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In the year 1755. when a pestilential sickness raged in the *North American* fleet, the *Torbay* and *Monarch*, both in equal distress, had their sick landed at *Halifax*. The men, belonging to each ship, were daily visited by the respective surgeons of both; and in every respect of diet, regimen, and medicines, were equally treated by their joint advice. The cases and fevers appeared altogether similar. Notwithstanding, there died of the men belonging to the *Monarch*, more every week, by one half, than of the *Torbay*'s people. This unequal mortality greatly astonished them. And the surgeons, after duly considering every minute circumstance with respect to the sick, found one point of difference only, to which the greater destruction among the *Monarch*'s men could be ascribed. It was this; the

* This will also appear from my second paper on this subject.

latter

latter were lodged in a large mill, without a fire-place; while the former were in ſome old houſes, not nearly ſo well accommodated, but where they kept a conſtant fire of ſpruce wood.

Next to the ſmoke of wood, for purifying a tainted air, I eſteem that of gunpowder. This I often uſe, as being quite inoffenſive to the lungs. The *Caſcarilla Bark*, when burning, gives a moſt agreeable ſcent to the chamber of the ſick, and ſo is at leaſt an elegant preſervative, and may prevent bad ſmells from taking effect. The ſteam of boiling camphorated vinegar is ſtill more powerful for this purpoſe.

Now, beſides correcting the ill quality of the air, and the purification of the chamber, another good effect is produced from ſuch ſteams and ſmoke, as are inoffenſive to the lungs. It is this; as ſoon as the vapour becomes denſe, the nurſes and patients become deſirous of the admiſſion of the freſh air by the door or windows. Now it is certain, that, provided the patient be kept well covered over, and the curtains of his bed, if neceſſary, be cloſe drawn, the air in the chambers of the ſick cannot be too often changed. And there is no argument which can be uſed, ſo forcible to prevent ſick perſons from incurring the

danger of foul air in a room or ward, (occaſioned by the obſtinacy of his nurſes or relations) than ordering it to be frequently fumigated or ſmoked. A practice more frequent in other countries than in this, and of great benefit to the ſick.

I ſhall, laſtly, deliver my ſentiments with regard to the purification of goods, moveables, cloaths, &c. which are ſuſpected to harbour infection.—And I cannot but take notice, that the uſual cuſtom of only unpacking and expoſing ſuch materials to the open air, is in many inſtances inſufficient to deſtroy the latent ſeeds of diſeaſe.

It will appear from a hiſtory, to be given towards the concluſion of my ſecond paper on this ſubject, that the ſpreading abroad of contaminated cloaths to dry, or to be aired, without a previous fumigation of them, may be of dangerous and fatal conſequence. A damp air, we have already ſaid, gives ſtrength to contagion, and a dry wind may ſpread the miſchief.—All ſuch ſuſpected ſubſtances ought therefore to be firſt fumigated in a cloſe place, and in the ſame manner as an infected chamber; and afterwards they may be ſpread abroad, and expoſed to the air.

The following late incident ſerves to enforce this precept. A common labourer having died

died laſt *April* of the ſmall-pox at *Porcheſter*; his wife carried his late wearing apparel, after airing them, as ſhe thought well, to the Town of *Havant*, about nine miles from *Porcheſter Caſtle*. And, for further ſecurity againſt the danger, ſhe permitted ſome weeks to elapſe, before ſhe made a preſent of her late huſband's waiſtcoat to a joiner's ſervant. This ſervant, ſoon after putting it on, took the ſmall-pox, and died. And before his diſeaſe was diſcovered in the family to be the ſmall-pox, (for which he was immediately removed from his maſter's houſe into a ſort of peſt-houſe) it was found out, that, from the ſame cauſe, one of the children in that family, with two of her little companions, who all three together uſed daily to walk, or be carried, to ſchool by that ſervant, were alſo infected. This occaſioned a general conſternation and fear in the town. But by making a proper ſeparation of the ſick from all others, and by taking other neceſſary precautions, the contagion, without extending itſelf further, was entirely ſtopt.

Let me add,—That the linen of the ſick in fevers, or ſuch cloaths about them as will admit of being waſhed, ought never at firſt to be put in warm water, as it is dangerous for any perſon to receive the ſteam that may hence ariſe. It is neceſſary to ſteep them firſt either

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in cold water, or in cold ſoap-lees, for ſeveral hours, that the filth may be waſhed off.

I have thus finiſhed what I intended to offer, with reſpect to the means of purifying infected places and ſubſtances; — and ſhall proceed to lay before you, in my next paper, what further has occurred to me, concerning the moſt effectual methods for removing an infection from ſuch perſons, as unfortunately may have become tainted with it.

End of the FIRST PAPER.

TWO

TWO PAPERS ON FEVERS and INFECTION.

PAPER II.

August 14, 1761.

GENTLEMEN,

I Could have wiſhed, that medical cuſtom had authoriſed me, in theſe papers, to have uſed ſome other words of equal ſignification, in the place of *infection* and *contagion*; — as thoſe appellations are apt by too many to be commonly underſtood under the alarming notion of a plague, a peſtilential or malignant fever. But I have here uſed thoſe terms in no ſuch limited ſenſe, but with an extenſive meaning to all fevers, of whatever kind, as are imparted from one perſon to another, either by a near approach to each other,

other, or by means of ſuch ſubſtances, as have imbibed particles by which a fever may be communicated and ſpread.

It is neceſſary to obviate alſo another vulgar error that prevails. — Nothing is more common, than to hear a fever, or other diſtemper, pronounced to be free from an infectious diſpoſition; and the attack of it upon a few attributed to very different cauſes, becauſe the perſon himſelf, who judges in this manner, has had the good fortune to eſcape, as ſome others may have done, who were equally expoſed to the infection.

This falſe manner of reaſoning hath done an infinite deal of miſchief to phyſic, in other inſtances as well as in this; when, from a few exceptions, an attempt is made to overthrow the eſtabliſhed maxims of the ſcience. As for example; if the bark ſhould fail of curing an ague, or mercury of removing a venereal taint, are we thence raſhly to conclude, that either of thoſe medicines will prove, in all other ſuch inſtances and caſes, ineffectual?

Now, as there is no remedy, though the moſt ſovereign in the world, which does not ſometimes fail of its ſucceſs, even in caſes where ſeemingly it is well adapted; ſo there is no contagion, ſo far as I think, yet known, that

that does affect all mankind indiſcriminately. Inoculation for the ſmall-pox ſometimes fails to produce that diſeaſe, and yet no one queſtions its being contagious. I never found in myſelf the leaſt ſymptom of an infection, although for three years I have daily attended people labouring under contagious maladies. And the young gentleman who was moſt expoſed, by being conſtantly employed in bleeding, and ſuperintending the other ſurgical affairs, in the fever wards of *Haſlar*, though he never uſed even the neceſſary precautions, but was greatly culpable in expoſing himſelf preſumptuouſly to danger, was alſo never in the leaſt affected. But it does not thence follow, that the fevers, during thoſe times in the hoſpital, were not infectious, as there are the moſt poſitive proofs of the contrary.

An infectious malady is not therefore always ſuch as the vulgar imagine it to be, — a calamity which ſpreads itſelf to every perſon who approaches; the plague itſelf is not altogether of ſuch a nature. We would then chuſe to define it a diſtemper, which, in certain circumſtances, is, or may be, communicated to one, two, or more perſons, and that, for the moſt part, in its identical form, and peculiar nature; which muſt be alſo ſuitable to the habit and diſpoſitions of the perſons who receive it. What theſe diſpoſitions

are, it is not the purport of this paper to inveſtigate. It may ſuffice at preſent, that I further illuſtrate and confirm my meaning, by an incident which has lately occurred.

In a ward where there were 18 marines, five of them were ſeized with a ſevere flux, being infected by two ſeamen, who were warded with them. Among 592 patients, then in the houſe, there was heard no-where this complaint, but in that ward. The five marines became themſelves ſenſible how they got the diſtemper, though 13 men, in a parallel ſituation, were never in the leaſt affected by it.

I relate this occurrence, to demonſtrate the impoſſibility of proving a diſeaſe not to be infectious, by the negative of ſuch as eſcape it.

In acute ailments, we judge the ſtools, more eſpecially if very fetid, to be the moſt communicative of a taint; next to thoſe, the breath, and laſtly, the *effluvia* from the patients in fevers.

But I muſt now proceed to the method of treating a perſon, who has received this infection from a fever; and would have it obſerved, that the manner ought to be altogether

gether ſimilar, whether the infection be acquired from a ſlighter or more virulent taint; and that it ſhould be practiſed alſo in all caſes of relapſes.

The effect of contagion is often ſudden and ſenſible. The ſlighteſt degree is that which is derived from the bad ſmell of patients labouring under offenſive diſeaſes. Laſt autumn I viſited a lady in the bilious cholic, whoſe diſcharges upwards and downwards were intolerably offenſive. A gentlewoman became ſo affected, only in paſſing the room, that ſhe was immediately ſeized with a retching and ſickneſs, which continued with her 24 hours. The nurſe, who attended, was by this bad ſmell, (which ſhe perceived at that time, as ſhe expreſſed it, to reach her ſtomach) at once taken with a giddineſs and vomiting. The vomiting became more ſevere at night, accompanied with a purging and frequent ſhiverings. By means of an emetic, both evacuations were ſtopped. Notwithſtanding, for ſome days afterwards, ſhe continued to have frequent *tremors*, a violent head-ach, with a low irregular pulſe; and did not recover ſo ſoon as the patient.

Such ſlight degrees of infection I have often obſerved to be derived from patients of a

groſs habit of body, when labouring under inflammatory diſtempers, and even other complaints.

A man was ſent to this hoſpital, ſuppoſed to have a fever. He was furiouſly delirious, with a full quick pulſe. Notwithſtanding plentiful evacuations, this *delirium* continued for two months, with ſhort intervals; when, underſtanding he had formerly been ſubject to it, we found his caſe to be plainly maniacal. A nurſe, upon raiſing this perſon up in her arms, was inſtantly ſeized, from an intolerable bad ſcent, with ſhiverings, ſickneſs, and a head-ach. Finding herſelf very ill, ſhe took a vomit in ſix hours afterwards, and paſſed the following night in profuſe ſweats, by means of a ſudorific draught. Next morning the violence of the head-ach was but little abated; for, upon every attempt to move, ſhe complained of a burning heat and pain in her forehead, and alſo became giddy. Her inclination to drink was frequent, and her pulſe low and quick. A bliſter was immediately applied to the back, and as ſoon as the bliſter took effect, the head-ach and thirſt entirely left her, with a calm pulſe. Next day ſhe aroſe, and was well.

I have the caſes of ſome, who received a ſimilar infection, from aſſiſting in putting dead

dead bodies into the coffins. In particular, one man lately from performing that duty to his meſſmate, who, after the operation of the vomit, it was neceſſary ſhould alſo be bliſtered. And laſt week I had two nurſes infected by a perſon in the ſmall-pox. Both were ſeized, in like manner, with ſhiverings, ſickneſs, and head-ach; the one after receiving the patient's breath, the other after making his bed. In one, a pain darted into her breaſt; in the other, into the breaſt, and ſmall of the back. The complaints of the former were ſpeedily removed by a vomit, though ſhe continued to have irregular returns of ſhiverings for three days afterwards. But in the latter, though the head-ach, ſickneſs, and *rigors*, were greatly abated by the vomit, yet a conſtant heat and thirſt, with a low pulſe, and a violent pain in the breaſt, indicated the neceſſity of applying a bliſter, which was done to the affected part; and next morning all her complaints were removed.

Thoſe infections I call the ſlighteſt; and, in 20 ſuch inſtances, I have not met with one that proved mortal, where the patient was properly treated; though, in many of theſe caſes, the taint proceeded from perſons in the ſmall-pox.

In

In diſcourſing with ſeveral, who have been infected by patients in contagious fevers, they generally compared the firſt impreſſion to an earthy, diſagreeable ſcent, received into the ſtomach, as from a grave newly opened, but not quite ſo raw as the cadaverous ſtench; and the effects of it, ſhivering and ſickneſs, were inſtantaneous. This is a particular ſmell, which cannot be deſcribed *; but is well known to the attendants about the ſick, and the nurſes, as it uſually accompanies fevers of extreme malignity, and, with the peculiar diſcharges from the bliſtered parts, may be reckoned among the moſt conſtant ſymptoms of a bad fever.

But many are not ſenſible of any effect from this poiſon at firſt; and it appears, by the obſervations contained in my former paper, that an infection from a fever will ſometimes continue about a perſon for many days, nay weeks, diſcovering itſelf chiefly by irregular ſhiverings, and thoſe ſometimes ſo ſevere, as to oblige the patients to have recourſe to their bed once or twice a day; ſometimes every other day.——Further, that amongſt a

* Some compare it to that of rotten ſtraw. It ſometimes moſt nearly approaches to the diſagreeable affecting ſcent from a perſon labouring under the confluent ſmall-pox at their turn, though it is not ſo ſtrong.

number

number thus affected, ſuch as are put into unſeaſoned chambers, or have ſat down on the cold ground, lain in damp apartments, *&c.* are immediately ſeized with a ſickneſs at the ſtomach, ſometimes with a dangerous purging, and often with fevers accompanied with bad ſymptoms.

It is alſo found, that in thoſe fevers, concerning which we are treating, the patients are very ſubject to relapſes. Now, in an infected place, whether houſe, chamber, or ſhip, where the ſeeds of contagion are harboured, frequent relapſes into fevers, even to the ſixth or ſeventh time, are not unuſual, and may juſtly be aſcribed to the influence of the contagion. But in a clean hoſpital, as this at *Haſſar*, where all the bedding, cloaths, *&c.* of the ſick, are duly purified by ſuch methods, as we are certain do effectually deſtroy the ſeeds of this evil, relapſes muſt be attributed to very different cauſes; accordingly, thoſe perſons were chiefly ſubject to them, who were irregular, obſtinate, and could not be brought to ſubmit to the proper confinement and reſtrictions of the houſe.

This may ſerve to evince the neceſſity of taking the utmoſt care of patients who are recovering, as I have remarked, that the irregular conduct of infected perſons, and eſpecially

cially their getting out of bed, or going abroad too ſoon, renders them ſubject to a return of the fever.

I muſt now beg leave to go further, and to offer it as a conjecture, — That theſe ſame cauſes, which occaſion relapſes, do ſometimes give motion to the *morbific effluvia*, (which were before received into the body) and enable them to produce ſuch effects, that probably might otherwiſe not have appeared. I am the rather of this opinion, becauſe, as I ſaid before, the effects of the communicated miſchief from bad fevers are often very quick, and ſenſible to ſome, immediately at the time the poiſon is received. But if a perſon perceives no ſymptom of an infection, till many days after having left the place of its abode, and is firſt taken ill of it immediately after having been wet with rain, expoſed to cold or damp, or been guilty of intemperance and exceſſes, it is probable, that theſe cauſes * have

* I have remarked many ſeamen, who belonged to infected ſhips, after having been ſeveral days at land, to be ſeized with their ſhip-fever, by over-eating, getting drunk, quarrelling, or the like exceſſes; and when they were ſent to the hoſpital, I have found them covered with *petechiæ*.

The circumſtance of the infection in the hoſpital, during the winter 1759. (as related in my former paper), having

have excited this dormant poiſon into action; and none can poſitively affirm, that, without their influence, it would ever have affected the conſtitution. Be that as it will, and let this infection have been aſleep for ſome time, either in the body, or in the cloaths, or other moveables about the patient, we cannot be too careful in guarding againſt its deceitful appearances, ſo ſoon as it is rouſed into action.

The coldneſs felt at firſt over the body, the ſhiverings, with ſlight ſickneſs at the ſtomach, tend to confirm the miſtaken opinion, that theſe are only the common ſymptoms of

having been entirely confined to the men from *North America*, further corroborates this ſentiment. There were in *December*, that year, 700 patients in the houſe, and of thoſe 200 came from infected ſhips, of whom above 20 were firſt ſeized with their ſhip-fever, after being ſome time in the hoſpital; having been received into it on account of other ailments. Thus for inſtance: — A ſeaman, belonging to the *Neptune*, was placed, for the cure of a hurt in one of his legs, in a clean ſurgery-ward. After continuing there 10 days, without having any other complaint, he, by ſtealth, procured ſome wine, ſo became drunk, riotous, and quarrelſome, and next day feveriſh. He was twice blooded for this fever, which was ſuppoſed to be inflammatory, and the effect of his debauch; but the third day, when brought into the fever-ward, I found his body ſpotted, and his fever of the ſame malignant kind, as that in his ſhip.

a cold, or ſudden chill, or what the vulgar term an ague. But when, from ſuch complaints, there is a juſt reaſon to apprehend an imminent fever, then is the time for the advice of the phyſician, as improper treatment, or the delay of a few hours, may produce effects beyond the power of medicine to remove.

To all who are ſuppoſed to be infected by fevers, during this ſtate of *rigors*, a gentle vomit is immediately to be exhibited, before the fever be formed, and before the fulneſs or hardneſs of the pulſe renders its operation dangerous. If the vomit be delayed too long, and eſpecially if bleeding muſt precede it, the moſt certain and favourable opportunity of procuring ſafety for the patient is paſt.

The effects of this antidote are ſo well known in the hoſpital, and have been ſo fully aſcertained by our repeated experience, that thoſe who are employed in the fever-wards, as ſoon as taken ſick, have immediate recourſe thereto, and it ſeldom fails to prevent the illneſs, which was juſtly to be expected. I have found it equally ſerviceable in preventing relapſes, when it is given immediately at the return of the ſhiverings. Let me add, that a looſe ſtool or two ſhould at this

this time be procured, either by means of the emetic, or of clyſters.

The vomit adminiſtered was generally very gentle, and ſeldom exceeded from ſix to ten grains of *Ipecacoanha*. The patient ſhould afterwards, when put to bed, take a ſweating and quieting draught, containing five grains of ſalt of hartſhorn, and from fifteen to twenty drops of *Thebaic* tincture. — At other times we have given five grains of *Camphire* every four hours, with large draughts of vinegar-whey. Eight perſons in ten got quite well by this treatment.

But if the head next morning be not altogether free from pain, or the fever is ſtill to be apprehended, ſomething more is to be done, which I ſhall mention, after premiſing, — That it muſt always be remembered, in caſes of infection, to purſue the moſt quick and vigorous meaſures, as ſoon as poſſible: As in the firſt hours, and afterwards days, of this fever, leſs muſt be truſted to nature, than in any other diſtemper.

We think no confidence ſhould be put, at this period of the diſeaſe, in *alexipharmic*, or ſweating medicines; in the boaſted ſpecific antidotes *mithridate*, *treacle*, and the like, which,

I am of opinion, in caſes of imminent danger, ought not to be uſed, till after proper evacuations.

But to proceed, if, as before mentioned, ſymptoms of a fever remain after the adminiſtration of the vomit, clyſters, *&c.* or ſhould the exhibition of an emetic have been altogether neglected, or unluckily delayed too long; or the patient injudiciouſly treated with ſweating medicines, and bleeding, where the proof of infection is evident; recourſe muſt ſpeedily be had to bliſters; theſe are to be applied to the back, if the head or limbs are affected; and to the breaſt, ſhould the pain have ſeized that part.

I do not know a ſurer mark of a prevailing infectious fever, than that of twenty patients to whom it has been communicated, and who were bliſtered at night, ſixteen will next morning be entirely free from heat, head-ach, pain, and fever. This is ſaid, provided the ſource of their infection be not ſo highly poiſonous, as was in the ſhip *Garland*, taken notice of in my former paper, or in other ſuch violent contagions. Nor can we affirm, that ſuch ſalutary effects would always be produced while the patient continued

in

in an infected place, or within the ſphere of its activity *.

How far thoſe means would operate towards expelling the ſmall-pox venom as ſoon as admitted, or, perhaps, in ſome other infectious fevers, that have not occurred in my practice, I do not know. But thus much I will venture to aſſert, — That, in the worſt infections I ever

* Agreeable to the inſtitutions of this hoſpital, all thoſe who laboured under fevers of whatever kind, were ſeparated from the other patients. They were kept remarkably neat and clean, having their linen often ſhifted, and even their beds once or twice a day, if requiſite. None but the neceſſary attendants were permitted to enter into any of the fever-wards, which were uſually fumigated every evening with gunpowder. When any perſon by having a flux, or otherwiſe, became offenſive, he was removed to the greateſt diſtance from others in the ward; and, near where he lay, the upper part of the window was kept open, and a pan of coals placed at his bed, in which the caſcarilla bark was kept burning. None were permitted to uſe the bed-pan, or other utenſils, which that perſon uſed.

When at any time the flux was prevalent, a ward was opened on purpoſe for the reception of men only in that diſeaſe. For the ſmall-pox and meaſles, diſtinct wards and nurſes were alſo ſet apart in the hoſpital; and no linen from thoſe laſt wards were allowed to be waſhed in the common waſh-houſe. So ſoon as a perſon was free from a flux, or the fever, he was ſent into other wards appropriated to the reception of ſuch recovering patients.

remarked,

remarked, the method prescribed has had better effects, than any manner of treatment recommended by the authors I have read on this subject, or any that I have had opportunities of trying myself. And in relapses, where I have had the most frequent cases for a fair trial, as also in the nurses, and other servants of the house, I have been fully satisfied of its beneficial effects.

Most of the men sent from the *Garland*, and some other infected ships, were blooded before they came into the hospital; but this operation is always dangerous, in proportion to the virulence of the taint. Fevers highly malignant will not bear bleeding; and though this operation be not so dangerous, nay sometimes necessary, in slight infections, where there is a fixed topical pain, with a full or hard pulse, yet it is to be remembered, that, after this evacuation, less benefit is afterwards to be expected from the vomit.

I cannot here omit further observing,—That much has been said against the promiscuous use of blisters, and their early application in fevers. In fevers truly inflammatory, and some other cases, I have known bad effects proceed from them. —But, what I have often reflected upon with astonishment, and has surprised the gentlemen who attended me, is, that

that, very ſeldom in thoſe ſhip-fevers, there was felt ſuch a ſtate of pulſe, as forbid their uſe. What ſome mechanical writers in phyſic have advanced, concerning the theory of bliſtering applications, or their acting as *ſtimuli*, and ſo always raiſing and encreaſing the fever, is not applicable to the moſt of thoſe fevers of which we treat, where, according to the nurſes phraſe, the patient generally received a *cool* from the bliſter.

When the infection by theſe means hath been removed, in 24 or 36 hours after the operation of the bliſter, the inteſtinal canal ſhould a ſecond time be gently cleanſed, by giving rhubarb, with a ſmall quantity of *vitriolated* tartar.

Theſe obſervations claim the more attention, as not being a few remarks made in private, or on any one particular fever, which might prove an exception to a general eſtabliſhed principle in practice *. They are the reſult

* I have often thought, that publiſhing only one or two ſingular or particular caſes, does more harm than good. If the effects of the medicine, or method preſcribed, are ſaid to be ſalutary, one or two trials of them cannot be thought ſufficient to convince us, that nature, and the conſtitution alone, could not have performed the cures without their aſſiſtance. But if the caſe is publiſhed with

result of an attention to some thousand patients, whose cases are still preserved in the hospital.

with a view to represent the bad effects of any particular medicine, or of any established method of practice, that may have proved evidently hurtful in this particular instance, what is the just inference from thence? Only this certain truth, that all the maxims of physic are limited, and that there is in it no universal infallible method, or remedy. And for this, there is one at least very obvious reason to be assigned, which is the peculiar *idiosyncrasy*, or constitution of each individual person; in respect of which not only food, but medicines act relatively. Hence mercury, bark, opium, and all other remedies, operate differently in various habits. In some, rhubarb will produce intolerable gripes, and to others, a simple dose of manna will become an emetic. Some are surprisingly affected with the smell of a particular flower, and eating the most innocent things hurts others; thus cheese, onions, and shell-fish, will produce sometimes *nausea*, vomiting, and symptoms as if poison had been taken. But why should I seek to multiply proofs of a thing so universally known? The just conclusion then, upon the whole, is this; that good approved methods and medicines are not to be discarded from practice, because, in some few instances, we are told, that they produced unfavourable effects; and in such cases the calumny is often most unjustly heaped on the medicine, where part at least may be due to the temperament or *idiosyncrasy* of the patient, whose particular constitution it is the business of a judicious physician to learn, study, and know, as much as it is to acquire a perfect acquaintance with the *materia medica*; and, in his final result of judgment, to have taken both under due consideration.

But

But as the beſt proof of the efficacy of any method, is the ſucceſs with which it is attended, I here give you an account of the mortality amongſt the nurſes, ſervants, and all other perſons in the hoſpital (excluſive of the patients), from *June* 1758. to *January* 1760.

In the firſt ſix months only one nurſe died, of whoſe caſe I kept no particular account. In the year 1759. there died two of the labourers, and two nurſes. With regard to the two former, how they were at firſt treated I know not. One of them, upon being taken ill, went to his own houſe, and there died of a fever. And the other I did not ſee till the eleventh day, when I obſerved him to be covered with ſpots, even to the end of his fingers; he had been a very irregular, drunken man. Of the two nurſes, the firſt was an old woman, who ſeemed to die purely of a decay of nature, without any juſt ſuſpicion of another cauſe. The ſecond died in the following manner, of an infection.

In the month of *April*, three months after the yellow fever had entirely ceaſed, two nurſes, lodging in the ſame chamber, were ſeized with fevers, and both became yellow; one died, the other recovered. From a ſtrict

examination it was discovered, that they had concealed some shirts and cloaths belonging to the infected men from *North America*. Those cloaths were taken from under their bed, and destroyed *.

Thus, in eighteen months, there died only five † persons from among above a hundred, who were severally, and some constantly, employed, during that time, in various offices about the sick.

This extraordinary preservation of such a number of attendants and residents in so large an hospital, compared with the mortality which we have heard of in other hospitals, in the ships, and at other places, can be ascribed only to these two causes.

The first was the speedy removal, and immediate purification, of the cloaths, bedding,

* A similar case to this occurred in three nurses, that attended the surgical patients, who were successively infected by lying in the same tainted bed; one of them, in whom an infection was not suspected, had a very bad petechial fever for near twenty days. From the other two the infection was speedily removed.

† There was another nurse taken ill in *November* 1759. but who did not die till the *January* following. The circumstance of her having been infected was somewhat doubtful.

&c. of every patient at his firſt admiſſion; the ſmalleſt article of apparel, belonging to a perſon in a fever, not being permitted to remain with him in the ward, nor even in the hoſpital. For, as ſoon as received, he was directly ſtript, and all his cloaths, with their contagion, conveyed to the ſmoke-houſe, where the taint was effectually deſtroyed.

Another cauſe of preſervation was the conſtant and early uſe of the proper means that have been preſcribed. There are now ſeveral nurſes in the hoſpital, who have been five, ſix, or even ſeven times infected, and thus ſucceſsfully treated; and I have had often two or three of them taken ill in a week.

I am apt to think, that an infection, from whatever impure fountain it is derived, does firſt diſcover itſelf by affecting the ſtomach and inteſtines. It is uncommon to find a caſe of this ſort, which does not begin with ſhiverings, commonly with a ſlight *nauſea*, often a vomiting. This aguiſh ſtate continues with ſome a ſhorter, with others a longer time; after which a pain is often felt to dart with violence into ſome one or other part of the body.

I attended three patients in the ſame ward, and all from the ſame ſhip, during their ſtate

of *rigors*. In one the pain attacked the head, in another it ſeized the breaſt, and in the third it deſcended to the legs, ſo as to reſemble a violent rheumatiſm.

We judge that a ſpeedy and thorough cleanſing of the whole alimentary tube, by the means of a vomit and clyſters; or even, perhaps, by a gentle, natural, ſupervening looſeneſs, waſhes away the poiſon. Whereas a ſevere flux indicates the miſchief at this time to be fixed, and as it were in a manner concentrated in that canal; from whence it is ſtill often ſucceſsfully diſlodged by an immediate emetic; or, if that ſhould fail, a bliſter, applied without delay to the back, ſometimes ſtops this looſeneſs as effectually, as at other times it removes the head-ach, pain of the limbs, or breaſt.

In reflecting on this ſubject, I have frequently wiſhed that it were tried, what effect the like method would produce in fevers, which are occaſioned by the noxious vapours exhaling from the earth, and the offenſive polluted air in unhealthy or marſhy places.

In *England*, and in other parts of *Europe*, according to the temperature of the ſeaſon, and the different pernicious qualities of the ſoil, the diſeaſes thence ariſing are either common

common agues, fluxes, or fevers, the latter being, for the moſt part, of a low and malignant nature. And there are many diſtant unhealthy parts of the world, where ſtrangers are ſure, upon their firſt arrival, to be attacked with diſtempers often fatal to them.

At *Senegal*, in the rivers *Gambia* and *St. Domingo*, on the coaſt of *Guinea*, at *Carpenter's River*, near the *Moſquito* ſhore in the *Weſt-Indies*, and in many other places, I have been told, that almoſt all *European* ſtrangers, at their firſt coming, loſe their colour and appetite, becoming yellow, and troubled with ſickneſs, or indigeſtion; and that gentle vomits are found very ſuitable to the conſtitution, and to the diſeaſes in thoſe climates.

The fever, with which they are ſoon afflicted, begins ſometimes with a *delirium*, oftener with a vomiting; it will not bear bleeding, but bliſters, camphire, and the bark, are the appropriated remedies for it, as well as for contagious fevers. If the patient, after the application of bliſters, ſtill continued bad, and was delirious, with a low pulſe, ſome have empirically given from five to ten grains of *calomel* joined with camphire, which was ſaid to remove the *delirium*.

*lirium**. This circumſtance would not have been mentioned (being a practice we cannot recommend), if I had not been informed, by ſome judicious and authentic accounts lately ſent me from the *Eaſt-Indies*, that mercury hath been experienced a moſt uſeful medicine in the *hepatitis*, after the inflammation had been ſomewhat abated by bleeding, and the neutral ſaline medicines. And to the uſe of the *mercurius alcaliſatus*, many of our troops in that part of the world have owed their preſervation, to whom, in that diſeaſe, it was freely adminiſtered.

We would, indeed, adviſe all thoſe, who intend to purſue the practice of phyſic, for the benefit of mankind, to peruſe the hiſtories of ſuch obſervations as have been made on the fevers of different countries, as alſo the antient relations of this diſtemper, together with the many excellent accounts of it publiſhed in our own times. For to the publi-

* Doctor *Whytt*, profeſſor of medicine, having deſired me to try at *Haſlar* hoſpital, in fevers accompanied with *delirium*, reſtleſſneſs, *tremors*, convulſions, and great agitation of the nervous ſyſtem, with a ſunk, or at leaſt not full pulſe, the effects of a fomentation of hot water by itſelf, or with a very little vinegar, applied to the legs and feet, by means of flannel cloths, renewed every five or ten minutes, I have often put this method in practice; and, when continued for ſome time, the patient commonly became calm, and fell into a ſleep.

cation

cation of ſuch writings, all improvements in the art of healing are entirely owing, notwithſtanding the contempt of the ignorant, the envy of the malevolent, and the cenſure of defects, to which authors are expoſed.

But knowledge in phyſic can never be attained otherwiſe, than by a ſeries of obſervations; for which we muſt add to our own experience, that of men who lived before us, or who practiſe in different places, carefully ſeparating experimental truths from *hypotheſes*. By the help of this acquired knowledge of what from age to age, or in different countries, has, by the inſpection of nature and diſeaſes, been diſcovered or improved, the mind becomes ſtored with experimental truths and obſervations. And a phyſician, thus qualified, will be enabled to take a comprehenſive and inſtructive view of the operations of nature, and of diſeaſes under various ſhapes, and as influenced by the climate, ſeaſons, weather, conſtitution, and medicines.

A judicious *ſynopſis* of the writings on fevers, in a chronological ſeries, would be a valuable book. Treaſures of uſeful knowledge might then be found in one volume, where, diſengaged from conjecture, ſuch naked truths ſhould only appear, as are confirmed by obſervations and facts. We might there

there contemplate, under one view, what advances have been made towards a more complete knowledge, and a more ſucceſsful method of treating this malady, ever ſince the time of *Hippocrates*. This book would perhaps not compriſe an abridgment of the works of above two hundred authors, whoſe obſervations would deſerve a place in it. And although a very ſtriking contraſt would appear in the theoretical opinions of authors, yet a nearer reſemblance, than perhaps is expected, might be found in the facts they relate. A better judgment might thence alſo be formed of the propriety of the peculiar denominations given to different fevers by the antient writers; and of the reaſons why, in every age almoſt, the appellations of fevers have been changed; — whether alſo fevers are eſſentially different in different countries, varying likewiſe their nature at different periods of time. Concluſions drawn from partial facts, and an imperfect experience of things, would there be diſtinguiſhed from more univerſal and better eſtabliſhed truths. And, perhaps, the influence of a favourite opinion, or of a pre-conceived fancy on the writings of ſome, even of our beſt inſtructors, ſuch as *Sydenham* and *Morton*, would more clearly be perceived.

Mangetus and *Bonetus* have greatly ſwelled the volumes of their collections of phyſical writings with hypotheſes, many of which they might have permitted to have remained without a tranſcript in the original. — Dr. *Daniel le Clerc* has given us a complete *ſynopſis* * of all that the antient phyſicians knew, taught, and practiſed. If the learned Dr. *Friend* had executed as fully the remaining part of that plan, his hiſtory of phyſic would have been rendered ſtill more valuable.

It is, indeed, very neceſſary for phyſicians to ſtudy the diſeaſes of foreign countries, as they may occur in *England*, more eſpecially to foreigners. Thus for example; in a *Negroe*, a native of *Mexico*, I obſerved the *black vomit*; and have ſeen *Weſt Indians* afflicted, when here, with the *dry belly-ach*. I lately viſited a lady of diſtinction, who was diſtreſſed for two years with a ſore mouth, and recurring purgings. During this time, ſhe alſo conſulted ſome of the moſt eminent phyſicians in *London*, as well as in the country. Some imagined it to be the ſcurvy, others a laxity of the bowels. After being at *Tunbridge*, *Briſtol*, and other places, where ſhe had the beſt advice, ſhe died of the *aphthoides chro-*

* Hiſtoire de la medecine.

nica, a diſtemper hardly known in *England*, but endemial in the iſland of *Barbadoes*, where ſhe was born.

But, to return from this digreſſion. *Fevers* being of all diſeaſes the moſt deſtructive to mankind, it is at leaſt to be wiſhed, that ſuch a ſpecific was found for continual fevers, as the *bark* is for intermittents. This is to be ſought for, perhaps, in *antimony*.—But even when obtained, much, as at preſent, would ſtill depend on timely and judicious evacuations, by bleeding, bliſtering, vomits, purges, *&c.* All, or either of which may do miſchief when unſkilfully adviſed, or when adminiſtered at improper ſeaſons; whereas, with prudent care, ſuch evacuations become the moſt certain means of relief hitherto known from this fatal diſtemper.

I have, in many hundred caſes of fevers, tried different *antimonial* preparations, and am convinced, there is in ſome of them a powerful *febrifuge* virtue, even when they act as an alterative. Many *antimonial* medicines are however entirely diveſted of ſuch a virtue, whilſt ſome poſſeſs it in a ſmaller degree, as *vinum antimoniale*; and others in a more eminent degree, as *tartarum emeticum*.

Anti-

Antimonials ſhould be exhibited in ſmall doſes frequently repeated. I often add four or five grains of *camphire* to each doſe, at other times *nitre* in like quantity. But, when much dependence is placed on nitre, it ſhould be given by way of clyſter, as well as by the mouth. When *antimony* ruffles or purges, it ſhould be adminiſtered in boluſes of *confectio cardiaca*, *electarium e ſcordio*, or even *philonium Londinenſe*; and, in caſes of great lowneſs, with the addition of five grains of *ſal cornu cervi*. The *contrayerva* and *Virginian ſnake-roots* have been much reputed for their alexipharmic qualities. Both roots are apt to be ſandy. An infuſion made of two drachms of each, for four or five hours, in a pint of boiling water, ſtrained and freed from the dregs by ſtanding, and taken to the quantity of two ounces every four or ſix hours, is a proper medicine for low fevers; to which, according to the judgment of the preſcriber, and ſtate of the pulſe, may be occaſionally added, either camphorated or diſtilled vinegar, and ſometimes *Rheniſh* wine.

In a former note * I obſerved, that medicines act variouſly in different habits, and always with an effect relative to, or as directed by, the conſtitution. On this ſubject I have

* See p. 71.

further to add,—that, in the corporeal frame, there is a wonderful faculty, which diveſts ſome ſorts of poiſons of their virulent and noxious quality, by means of their long uſe. And in the ſame manner many excellent medicines loſe their ſmart, quick, or effectual operation, when the body is once become habituated to them. And this is oftener the caſe, when ſuch medicines paſs the ſtomach, without occaſioning a ſickneſs there, or when their daily uſe does not produce a loathing. If a perſon takes as much jalap as will purge, and every day repeats the ſame doſe, he will, in all probability, find that quantity of jalap will, at length, by conſtant uſe, abate much of its purgative quality. Cream of tartar has, with ſome, very ſingular effects. At firſt it is laxative, till the perſon has taken it for ſome days, and then it acts as an aſtringent of the body, until the purgative quality is again reſtored, by increaſing the doſe. In phyſic we are very ſenſible, that ſome of the beſt remedies may, in like manner, by frequent uſe, become much diminiſhed in their virtues, particularly antimony, opium, and the bark.

In acute diſeaſes, for theſe reaſons, all medicines of an important efficacy, when continued, ought gradually to be augmented in the doſe, ſo as not without intention to ruffle

the

the ſtomach or bowels. And, in the maladies of longer duration, preſcriptions ſhould, after a proper time, be prudently changed for others, new to the conſtitution of the patients.

Further, not only in hoſpitals, but in all private families, perſons in fevers ought to be kept ſeparate from others, and free from the idle viſits of over-officious friends, and of all diſturbance and noiſe. This ought to be done more particularly, with a view to the enjoyment of that tranquil and hopeful ſtate of mind, which muſt co-operate with the mechanical ſalutary effects of medicines towards a recovery. I can affirm, that I have known many patients, who may be ſaid properly to have been killed by the fatal ſhock or ſurpriſe given to them by an account of the death of a friend, or of one or more perſons, who were afflicted in the ſame ſtate that they imagined themſelves to be in.

Thoſe who neglect the *medicina mentis*, or a due attention to the paſſions of the mind in ſickneſs, are inattentive to one of the moſt important aids towards the relief of it. For, if the moſt wholeſome food does not nouriſh, when the deſponding mind is oppreſſed with grief and fear, neither can it be expected, with a perſon under the influence of thoſe afflictive

flictive paſſions, that the moſt appropriated medicines will produce their ſalutary effects.

But to proceed; as we have often in theſe papers made mention of *petechiæ*, it may, perhaps, be now proper to deſcribe the appearances on the ſkin, that were meant by this term. Thoſe black and purple ſpots, or *petechiæ*, which are obſerved at the fatal period of a malignant ſmall-pox, I have not commonly met with in other fevers, though ſometimes, where there was a bad fever, I have noted black and roundiſh ſmooth ſpots of blood, in the interſtices of a ſmall miliary eruption. But oftener the *petechiæ*, which we have remarked, were of a pale red, reſembling a raſh, appearing ſometimes to the eye elevated, but commonly found to be flat by the touch. On the back, loins, and thighs, they appeared often of an irregular figure, and ſo numerous ſometimes, that they ſeemed to ſtreak the ſkin. In ſome patients, received from the ſhip *Garland*, (ſo often mentioned), the *petechiæ* were viſible, without once diſappearing, for five or ſix days. But their preſence is generally more inconſtant, and often not obſerved, unleſs carefully attended to, which happens on account of their frequent vaniſhing, and of their faint appearance at times, under the ſkin.

Theſe

Theſe appearances in malignant fevers are generally ſuppoſed not to have been taken notice of by the antients. But *Hippocrates* deſcribes ſpots ſimilar to them; and *Aetius* expreſly ſays, that ſmooth ſpots, reſembling flea-bites, appear on the ſkin in malignant fevers.

Some authors, from a ſuppoſition of the great diſſolution of the blood in *petechial fevers*, and from another ſuppoſition, that bliſters encreaſe the diſſolution of that fluid ſtill more, have forbid their application in ſuch fevers. But the experience of the moſt eminent practitioners does not ſupport thoſe theoretical opinions *.

It is here to be remembered,—that the malignity in no common fever can be cha-

* *Riverius* treats of the petechial and peſtilential fevers in the ſame chapter, where he ſays,

Ubi maxima eſt malignitas, unicum veſicatorium non ſufficit, ſed plura admovenda ſunt; ſoleo ego in magna morbi ſœvitia, quinque locis admovere, cervici nimirum, utrique brachio, parti interiori inter cubitum et humerum, et utrique femori, parti etiam inferiori inter inguina et genua, *cum felici ſucceſſu.*

Riverii opera, p. 541.

And *Etmuller*, treating of the ſame fevers, ſays, Si ulla eſt febris in qua veſicatoria conveniunt eſt imprimis petechialis. p. 365.

racteriſed

racteriſed by ſpots alone, unleſs ſuch as have been deſcribed, be accompanied moſt commonly with a low, ſunk pulſe, and the patient be either comatoſe, delirious, or both, having his countenance either bloated, or fluſhed with a pale red.

I have ſeldom been able to form any prognoſtics of the fever from thoſe ſpots, becauſe of their extreme mutability in form, colour, and ſize. When a perſon was firſt brought into the hoſpital, there has often been obſerved numerous, ſmooth, black, and purple ſpots on the ſurface of the body, eſpecially on the back and loins. After he was put to bed and refreſhed, thoſe ſpots were ſometimes hardly diſcernible, and at other times they had turned red, and felt rough or ſcaly. Nay, ſo mutable at times was the nature of ſome ſpots, that I have remarked a glaſs of wine given to the patient, or a ſudden alteration in the paſſions of his mind, had an effect to change their colour, and ſometimes to occaſion their diſappearance, when a roughneſs was perceptible in their place.—And this naturally leads me to ſay ſomewhat concerning the prognoſtics in fevers.

We judge it to be experience only, joined to a natural medical ſagacity, that can render a phyſician eminent, as many have been, by their

their predictions in fevers; becauſe there is no permanent conſtancy, or invariable uniformity, in any one febrile ſymptom, on which alone ſuch juſt predictions can be grounded. The pulſe, in which ſo great confidence is to be placed, does ſometimes, in fevers, point out but a ſmall danger, even while the patient approaches near death. When felt in different places, phyſicians ſometimes find it various, and in the ſame place often altered after an interval of an hour or two.

A juſt prognoſtic is therefore formed from a contemplation, in one view, of all the occurrences and ſymptoms about the ſick, and by making a proper allowance for the greater degree of certainty and fallibility in each. Thus, the countenance of the patient, eſpecially the eyes, the poſture in which he lies, the manner in which he breathes, ſpeaks, eats, drinks, or ſwallows; the ſtate of the pulſe, of the tongue, of the urine, and of all the other excretions, compared with a review of what has paſſed, ſtrikes the mind of the experienced and ſkilful practitioner with a quick incommunicable ſenſe, and an idea of danger or ſecurity, ariſing from his natural and acquired habit of judging.

I never had an opportunity, at *Haſlar* hoſpital, of ſeeing fevers riſe to ſuch a malig-

nant height as to produce *buboes* in the groin *, livid blotches, or mortifications. We have, tho' but ſeldom, obſerved, in very violent infections, a ſwelling of the *parotid glands*, which, for the moſt part, was unattended with a fever; notwithſtanding that, ſuch as were in this manner ſeized, commonly died. *Aphthæ* were alſo unfrequent ſymptoms. Amongſt the worſt ſigns and appearances of ſuch contagious fevers as I have had occaſion to treat, were a ſunk, lifeleſs ſtate of the eyes, in ſome a moſt offenſive ſtench from the breath, and from the whole body, a noiſome diſcharge from the bliſtered parts; ſometimes ſpots on the body, at other times an univerſal yellowneſs.

I have remarked in a few inſtances, that ſome perſons, who have once been infected, though they were ſpeedily relieved by a vomit and bliſtering, yet afterwards became, for ſome time, ſickly, and afflicted with irregular complaints. This happened chiefly in weak conſtitutions, to hyſterical women, and in very malignant taints.

* In the beginning of this year, I had occaſion to ſee, at *Wincheſter*, many of the *French* priſoners, who were infected with a fever of a very malignant kind, attended with buboes both in the groin and the arm-pits, and other peſtilential ſymptoms. They were put under the care of Dr. *Welſh*, a ſkilful phyſician in that city.

And

And this leads me to take a view of the ſtate in which the conſtitution is often left after a fever, when it has been violent, or of long continuance: a matter which ought to be well underſtood.

Many, eſpecially women, and thoſe of a delicate habit, and particularly during hot weather, are often reduced, by fevers, to an extreme degree of imbecility, accompanied with a frequent purging, proceeding from mere weakneſs. Too much care cannot be taken at firſt, to check this deſtructive waſte of ſtrength, not by vomits or purges, which, in ſuch circumſtances, prove hurtful, but by ſtrengthners, by wine, by japonic tincture, toaſted rhubarb, and a mixture of the thebaic and bark tinctures,

Others are, at this period, ſubject to a conſtant teaſing cough, proceeding altogether from their weakneſs. I have opened ſeveral who died exhauſted in this condition, and who, from their inceſſant cough and ſpitting, great weakneſs, frequent purgings, difficulty of breathing, and other ſymptoms, were ſuppoſed to have died of a conſumption of the lungs. But I found thoſe ſymptoms in ſuch weak perſons (where the caſe had not been *peripneumonic* or *pleuretic)* moſt commonly to have proceeded from the *ſerum* of the blood extra-

vaſated into the *tela celluloſa* of the lower extremities, and into the cavities of the breaſt and belly.

It is not to be ſuppoſed, as the antients did, that the *ædematous*, or ſwelled legs, common to ſuch people, are diſtended with phlegm, nor are they inflated with wind or air, but enlarged by water. When ſuch ſwellings diſappear, as is uſual by lying in bed, or in an horizontal poſture of the patient; this water is returned into the belly, and often into the breaſt, where it occaſions, if in great quantity, an inceſſant cough and ſtitches.——I ſay, if in a great quantity, being perſuaded, that a ſmall quantity of water, eſpecially if contained in the belly, gives little or no uneaſineſs. But generally in thoſe perſons there was a great deal of water found in both thoſe cavities, and in the legs; ſo that ſuch patients apparently died of an univerſal dropſical or watery habit.

It is an admirable obſervation made by the judicious *Sydenham*, that the beſt remedy for a cough, after a fever, is a rich nouriſhing wine: a cordial which, I think, ſhould never be omitted at that period; to which we may add, a bitter of the bark, and every morning the uſe of warm milk, with a ſpoonful of ſome agreeable ſpirituous and diuretic water put into it.

Where

Where there was no flux, but a conſtant and waſting ſpitting, I have ſometimes given a few grains of calomel and rhubarb with a good effect, by way of a gentle hydragogue purge.

But if this ſtate of weakneſs becomes inſuperable by milk of women, aſſes, or of cows, with the reſtorative aid of bark, wine, gentle exerciſe, and change of air, and by diuretic and hydragogue medicines; the ſcene of life is often cloſed with one of the moſt affecting ſpectacles of mortality. The habit and look of the patient beſpeak a quick approach of death; and when the water, in form of phlegm, is ſpit up to the quantity of a pint or two daily, as I have frequently obſerved it, or evacuated by other too copious, conſtant, and unnatural drains, he becomes ſo waſted, as to bear the reſemblance of a mere animated ſkeleton; tho' ſtill fully poſſeſſed of every faculty of the ſenſes, and of a ſound mind. Such a perſon is apt, at this time, to become fondly tenacious of life, and to conceive the moſt eager expectations of it from every future change of weather, diet, or of medicine, that is mentioned, and from all ſuch caſes as his own, favourably repreſented to him. One good and refreſhing ſleep, obtained after a tedious watching in pain and anxiety; a ſhifting of the diſtreſs from one part to another of the body,

where

where it is become more tolerable — a ſhort reſpite from the cough — an abatement of the purging — the return of a longing and falſe appetite, with more calm ſpirits — all of theſe conſpire to flatter him with pleaſing, but deluſive hopes, until the ſcene is cloſed, and the curtain drops, which ſeparates this world from his view.

One would indeed be apt to judge from ſome books, as well as from the bills of quacks, that men would never die in or after a fever. But phyſic does not promiſe immortality. For ſome years paſt, I have every day viſited an uncommon number of patients afflicted with the fever; and it may be believed, my attention was not wanting to their preſervation. For this purpoſe, every method of relief, that I could deviſe, was attempted; and new objects almoſt every morning preſented themſelves to furniſh further matter for experience and reflection. The hoſpital was liberally ſupplied with the beſt medicines, with wine, and every thing proper for the ſick; and every method was made uſe of that could poſſibly contribute to their eaſe under affliction, or to their relief from it. Notwithſtanding all which, fevers often proved fatal. And indeed we daily ſee even a very ſimple wound, ulcer, or tumor, will ſometimes elude the whole art and power of ſurgery.

Let

Let us now paſs on to remark the appearances after death, in ſuch who have died of contagious fevers.—In the few I have opened, very large collections of *matter* were generally found in ſome of the cavities of the body. —In a man who died on the eleventh day of a yellow fever, whoſe body emitted no bad ſmell thirty-ſix hours after death, and was ſtill yellow, I found all the bowels of the lower belly ſound; the liver and ſpleen were remarkably ſo, as alſo the ſtomach and inteſtines. There was no ſuffuſion of the gall either in the guts or ſtomach. The gall-bladder, of the natural ſize, contained the uſual quantity of bile, ſomewhat thicker than common, and grumous *.

Upon examining further, his diſeaſe was found to have lain wholly on the left ſide, where, within the breaſt, was found near a quart of yellowiſh water, in which were many large flakes of yellowiſh cruſts or *gluten*, appearing, by compariſon, preciſely the ſame with the thick pellicle, which had covered the blood taken from his arm. Portions of

* In others, who died in this yellow ſtate, I have found the gall in its bladder of a thick roapy conſiſtence, like pitch, but never ſaw the liver in the leaſt affected. I at firſt, in ſeveral bodies, opened the head only, but afterwards judged, that all the cavities ought to be inſpected.

theſe flakes bore, in ſeveral places, a reſemblance to a membranous ſubſtance beginning to be converted into a purulent jelly. The *pleura*, both on its inſide and outſide, as alſo the exterior membrane of the lungs (which, in ſome parts, was greatly thickened) were covered with cakes of this cruſt, hanging in ſome places looſely, in others adhering more ſtrongly; and all in different ſtates of yellow or purulent corruption. The right cavity of the breaſt, and all the other parts of his body, were found intirely free from diſeaſe.

His complaints had been chiefly in his breaſt; and a ſmall quantity of blood, taken from him two days before his death, was covered with an impenetrable, yellow, thick *gluten*; the red portion below it being quite looſe.

I have alſo, in thoſe fevers, ſeen the diſeaſe entirely confined to the heart and *pericardium*. In one, who died the tenth day of the fever, without having been yellow, a quantity of *pus*, and purulent cruſts, were found mixed with the water of the *pericardium*. The heart, in different places, was excoriated, and, together with the inſide of the *pericardium*, was lined with a thick membranous cake, of the ſame quality with that already mentioned on the lungs and *pleura*. In ſome places, this cake

cake had a purulent, in others a jelly-like appearance, exactly reſembling the ſize of the blood. His complaints had been a great oppreſſion on the breaſt, and an extreme difficulty of breathing. In a third perſon, who died on the 13th day of the fever, above two quarts of *pus* and purulent jelly were found in the cavity of the belly. The ſource of ſuch an extraordinary quantity of matter, was not from any preceding inflammation, or an impoſthume, that we could diſcover; but from innumerable ulcerations on the caul, the ſurface of the guts, the *meſentery*, and *peritonæum*. Neither did thoſe ulcerations (or excoriations, as they rather appeared in ſeveral places) ſeem the primary fountains of the matter, but to have been occaſioned by its acrimony.

It would be altogether foreign from the purport and intention of theſe papers, to dilate on the ſpeculative concluſions which might be drawn from the obſervations contained in them; I ſhall therefore, on that head, pray only for a very ſhort indulgence. And it muſt firſt be premiſed, that the blood taken from perſons in a fever, and even from perſons in perfect health, though not ſo frequently, does, after ſtanding in a clean veſſel for a ſhort time, commonly ſeparate into three diſtinct portions; *viz.* the ſerum, or water of the blood, the red concreted maſs,

and a viſcid pellicle, termed the ſize, which ſpreads itſelf on the top of the red concretion. Some time ago, when making experiments with the blood taken from perſons in the ſcurvy, I was ſurpriſed to find it often covered with that ſizy cruſt. This induced me to extend my experiments to large quantities of different blood, which I had opportunities of inſpecting at once in ſo large an hoſpital. For which purpoſe I one morning ordered ten patients in the ſcurvy to be bled, taking two ounces from each. A larger quantity was taken, for its inſpection, from two men in health. That day I had occaſion to preſcribe bleeding to a woman in labour, two hours before her delivery, to a girl of ſixteen years of age afflicted with a lunacy proceeding from the *chloroſis*, to three patients in the rheumatiſm, and to a perſon labouring under an obſtruction of the liver.

From a nice compariſon, and an examination of the different blood, I found in all, that the more ſize there was on the top, and the thicker and more viſcid this white pellicle ſhewed itſelf, the concretion below it was generally of a more looſe coherence. This was not ſo obſervable, when only ſome ſlight ſtreaks of white appeared on the top. But when much ſize had ſeparated itſelf, the red maſs became very ſoft at the bottom of the containing

containing veſſel; and leſs compact in its different parts, in proportion to their diſtance from the ſurface, towards which this whitiſh portion had aſcended.

From this, and from other experiments *, it appears, that this cruſt or pellicle is the natural *gluten*, or cement of the blood, which becomes ſtrongly diſpoſed, in certain circumſtances and diſeaſes, to ſeparate itſelf. And whereas the ſerum and red concretion are eaſily incorporated together, it will be found, that this glue, after its ſeparation, becomes immiſcible with either. We have, by gentle drying, converted it into a perfectly tough, elaſtic membrane; and by the means of a ſmall portion of the red maſs, being left adhering to it, into a ſubſtance reſembling muſcular fleſh; and it is capable of undergoing various changes into corruption, in the ſame manner as either of theſe.

Now, I can ſee no reaſon why this *gluten*, in its morbid ſtate, may not ſeparate itſelf from the circulating blood, and be depoſited in the cavities of the body, as readily as the ſerum does in dropſies; the former having always a leſs diſpoſition than the latter to incorporate with the maſs.

* See the analyſis of the blood, by Dr. *Davies*.

In diſſecting perſons who died of fevers in *London* and *Minorca*, and where no infection was ſuſpected, appearances ſimilar to theſe have alſo fallen under the inſpection of thoſe accurate anatomiſts Drs. *Hunter* and *Cleghorn* *. Hence it may be preſumed very difficult to diſtinguiſh fevers that are produced by infection, from ſome others. I cannot however be induced to think, as thoſe gentlemen ſeem to do, that theſe preternatural ſubſtances, which were found in the cavities of the body, are the conſequence, but rather that they are the cauſe, of the inflammation and excoriations. I believe them to be at firſt diſeaſed, extravaſated *gluten*, and conjecture their different ſtates greatly to depend upon the different times at which they were depoſited.

I have remarked, in a variety of dead bodies, three different extravaſations from the veſſels; and theſe occurred in ſuch as had died of the ſcurvy, the conſumption, and in fevers. In the former of thoſe diſeaſes, red, coagulated blood is found extravaſated in almoſt all parts of the body, not only into the *tela celluloſa*, but into the bellies of the muſcles, particularly of the legs and thighs,

* See *Cleghorn* on the diſeaſes of *Minorca*, p. 248.

which

which often become quite ſtuffed, and even diſtorted, with large grumous maſſes. The guts and meſentery are often ſpotted alſo with extravaſations; and I have ſeen large *ecchymoſes* on the ſtomach. Thoſe appearances, at firſt ſight, reſembled ſo many diſtinct mortifications, and by this appearance ſome anatomiſts have been deceived; but, upon a nice examination, the texture of the parts is found to be ſound and firm. There is likewiſe, in that diſeaſe, ſometimes remarked an extravaſation of water, chiefly collected, and always, when in the legs, confined to the *tela celluloſa*.

But whereas in the limbs of ſcorbutic perſons, it is extremely difficult to make a good diſſection, by reaſon of ſuch quantities of extravaſated blood, that every-where obſtruct the operator; ſo, on the contrary, the lower extremities of thoſe who have died conſumptive, with ſwelled legs, are, of all other ſubjects, in the beſt ſtate to afford a ſatisfactory view of the muſcles. The water encloſed in their legs having inſinuated itſelf, by paſſing in the *tela celluloſa*, into the ſpaces betwixt the muſcles; the muſcles are eaſily ſeparated from each other, and their ſeveral origins and inſertions may be diſtinctly traced, by means of their having been cleanſed and waſhed by the water in the inveſting cellular membrane.

brane. Thus there are extravaſations of three ſorts; *viz.* firſt the grumous maſs in the ſcurvy; and this I have often remarked where no ſerum was obſerved. Secondly, the ſerum alone in anaſarcous ſwellings. The third and laſt is what was taken notice of in thoſe who died of fevers, being the *gluten* of the blood, accompanied for the moſt part with ſome ſerum, both of them altogether confined in the large cavities of the body.

I conjecture, that in thoſe fevers there is always an ulcerous or purulent diſpoſition in the blood, and that this glutinous part, or its cement, is greatly diſeaſed. I have frequently ſeen it have a true purulent appearance ſoon after it was drawn off, when the patient ſeemed not very bad. And if the cauſe of infection be certain foreign atoms, or corpuſcles, admitted within the body, and at length mixing with the blood, the glutinous part of that compounded fluid ſeems not only the moſt apt to retain ſuch morbific particles, but is primarily affected, agreeable to the beſt theories that have been offered on contagious fevers. For if we reaſon, upon the opinion hitherto too commonly received, that contagion diſſolves the blood, ſtill the *gluten* muſt principally and chiefly be diſeaſed.

And

And I further conjecture, that the miſchief often lies within the breaſt; as alſo that the great and experienced benefit, derived from the very early application of bliſters, flows from ſo many ulcerations and vents being timely provided for the complete diſcharge of thoſe purulent and tainted particles; by which outlets, they and the infection are freely diſcharged from the body.

It is an obſervation of the beſt practical writers, that iſſues and ſetons are moſt excellent preſervatives againſt receiving an infection, nay, even that of the plague itſelf. And indeed a ſuppuration and plentiful diſcharge from a proper ulcer, whether produced by nature or by art, ſeems to open a channel the beſt appropriated for an exit out of the body, to ſome of the moſt malignant poiſons. Thus, the moſt hopeful criſis in the plague, and in moſt peſtilential fevers, happens when nature excites tumors kindly ſuppurating in the groin, or arm-pits, by whoſe beneficial and plentiful diſcharges, the deadly poiſon is expelled from the conſtitution *.

* Let us take the definition of the peſtilential fever from a very great phyſician:

Febris peſtilentialis eſt acutiſſima, a miaſmate venenato orta, ac niſi vigore motuum vitalium venenum per bubones

I have obſerved it to be among the moſt certain characteriſtics of the worſt fevers, that the bliſters either don't riſe and fill, or diſcharge ſuch yellow, greeniſh, fœtid, and horribly offenſive ſtuff, that even experienced nurſes could give a pretty certain conjecture from them, of the different degrees of malignity in the fever. We have more than once endeavoured to conceal the bad ſtate of ſome patients in the hoſpital; but a diſcovery was always made of their condition in the waſh-houſe, from the linen ſent there ſtained with the diſcharges from the bliſtered parts. And, indeed, a careful inſpection of the ſtate and diſcharge from the bliſters, together with their effects, furniſhes us, in thoſe maladies, with ſome of the moſt certain diagnoſtics of their nature, and prognoſtics of their event.

I cannot conclude this paper without further obſerving,—That infection, this dread-

bones et carbunculos cito propellatur, lethalis. Hoffman. med. rat. ſyſtem. tom. iv. ſect. 1. cap. 12. De febre peſtilentiali.

There is a remarkable paſſage in *Galen* to this purpoſe:

Ex febre peſtilenti omnes evaſiſſe quibus exulcerationes in variis corporis partibus contigerant, evacuata nimirum per ea ulcera materia morbifica. Lib. 5. meth. med. cap. 12.

ful

ful ſource of diſeaſe, upon which we have laboured to throw ſome uſeful light in defence of mankind, againſt mortal and conſuming maladies, is not confined to armies or fleets, in ſhips or in priſons; but it elſewhere, in places often unſuſpected, exerts its malignant influences.

When a nurſe, or when two or three perſons in the ſame family, are ſeized with a ſimilar fever, cold, fatigue, and grief, are ſolely blamed, or the like cauſes, which ſtrongly diſpoſe the conſtitution to receive and animate the taint. When ſuch diſeaſes attack (as I have known) a boarding-ſchool of boys or girls, the fatal diſtreſs is often aſcribed to cauſes which were not in the leaſt acceſſory. Of this there was a late inſtance in a large neighbouring town, where a fever, in one of thoſe ſchools, was judged not to proceed from infection, but from another cauſe, becauſe it attacked young ladies of a certain age only. The truth was, it ſeized many of the young ladies in that houſe alone, and ſeveral died.

When ſpots are obſerved to riſe above the ſurface of the ſkin, the fever by ſome may be ſuppoſed miliary, and free from any danger of being communicated. But, in contagious fevers, thoſe raiſed ſpots are very common.

In the malignant fever before-mentioned, that prevailed among the *French* priſoners in *Wincheſter Caſtle*, and where the contagion was very mortal in the beginning of the year 1761. I remarked the ſpots were on moſt of the patients elevated, and of the miliary kind.

I have thus offered a few thoughts on a ſubject, which it is to be wiſhed was more univerſally ſtudied and known. The particles of contagion are for the moſt part of ſo ſubtile a nature, as ſeldom to fall under the inſpection of our ſenſes; hence in this, as in other ſubjects ſo abſtruſe, there is a large field open for diſſentions. Men indeed of the greateſt learning have frequently diſagreed in their opinions concerning the real or poſſible exiſtence of an infection from many diſtempers: of which the yellow fever in the *Weſt-Indies* furniſhes a very ſtriking inſtance.

Not long ſince, this fever became an object of conſideration before the right honourable the lords commiſſioners of trade and plantation, where it was urged (among other reaſons for not removing the ſeat of the government and juſtice in the iſland of *Jamaica*, from *Spaniſh-town* to *Kingſton*), that there was danger from the *Greenwich* hoſpital, ſituated near *Kingſton*, of an infection from the yellow fever being frequently communicated to that town.

town. On this affair the opinion was taken of a phyſician, who had long practiſed in that iſland. And by him it was judicially and clearly given, that, from the yellow fever in that iſland, there was no infection. This was not only the opinion of that gentleman in the court, but is the belief, as I am informed, of the beſt practitioners in that iſland; as alſo of Dr. *John Eliot*, a ſkilful phyſician in *London*, of Mr. *Naſmyth* *, and many others, who have had opportunities of being well acquainted with the diſeaſes of *Jamaica*.

On the other hand, our *American* colonies are under great apprehenſions of the importation of a yellow fever, in goods and in ſhips, from the *Weſt-Indies*, by which they have often ſuffered. Dr. *Linnen*, in his account of the yellow fever in one of your former volumes, ſuppoſes it to be infectious; others have alſo been of the like opinion.—And it is but a few years ſince, when a gentleman dying at *Barbadoes* of a yellow fever, his wearing apparel and linen, packed up in a cheſt, were ſent to his friends at *Philadelphia*; where, upon opening the cheſt containing thoſe tainted veſtures, the family was taken ill; and the cloaths being unluckily hung abroad to be

* See his letter relating to the fevers of *Jamaica*, in the eſſay on the means of preſerving ſeamen, p. 49.

aired, they presently diffused the contagion of this yellow fever over that town; by which the gentleman, who furnishes me with this relation, was an unhappy sufferer, and of which fever 200 persons died.

We can only reconcile the facts that may be produced on both sides of this question, in support of those opposite opinions, by supposing, that the yellow fever in the *West-Indies* is sometimes of a mild nature, and altogether free from infection, while that, at other times, it is of a different and highly infectious disposition, which naturally gives birth to this reflection,—That the vulgar appellations, or terms given to fevers, do sometimes disclose to us very little of their true nature and disposition. Thus much is certain, that from the same infection, I have known to proceed what might be termed, from outward appearances, the yellow, petechial, and miliary fevers, and while in a few the contagion assumed an intermitting form, and was mild, in others it raged with a constant fever.

Notwithstanding the difficulties that attend all inquiries into the nature and properties of infection, and the influence of various causes on its operations, yet there are, perhaps, but few subjects upon which the vulgar and inexperienced do so freely give a decisive judgment.

But

But it would ſeem, that in no point ought we to be more cautious, eſpecially in admitting of the negative aſſertion, than in a deciſion often ſo highly intereſting to the public or private ſafety, whether in a general, or domeſtic calamity by diſeaſe.

Thus many countries and cities, in all human probability, might have eſcaped the dreadful ſcourge of the peſtilence, by taking the proper meaſures * on its firſt and moſt early appearance; if, on ſuch-like occaſions, the incredulity of a few had not been ſo great, as generally to deny a contagion to be in the plague itſelf at its firſt breaking forth. Their reaſons were, becauſe no marks of contagion were found on the dead bodies, becauſe its progreſs was ſlow, becauſe it raged at firſt chiefly among the poorer ſort, and might be owing to poverty, to corrupted food, or unwholſome drink, and many other conjectural cauſes. That this proved their fatal miſtake,

* Separating the ſick from the ſuſpected, though in health; and ſhutting both of them ſeparately up (with their proper officers and the neceſſary attendants) from all others: carefully tracing out the imported or generated poiſon, wherever it is lodged, that the infectious atoms may be in all places effectually deſtroyed, by the judicious application of fires and ſmoke, are the moſt probable means of ſtopping a plague, or any other mortal contagion.

is well known to ſuch as are converſant with the hiſtories of the different plagues in *Europe*. And the like arguments are frequently and improperly uſed againſt the exiſtence of any infection.

But the phænomena, even in the moſt manifeſt contagion, are often wonderfully myſterious, and altogether unaccountable. Thus the ſmall-pox has been for ſome ages paſt, and continues ſtill to be, the terror and deſtroyer of a great part of mankind. But from what origin, or how, was this poiſon firſt engendered? Many opinions have been given, on this matter, equally incapable of proof or refutation. And the original cauſes of this, as well as of ſeveral other contagions, continue ſtill, perhaps, among the hidden ſecrets of nature; notwithſtanding the many plauſible conjectures concerning them. The real exiſtence of an infection can only be aſcertained by its viſible effects, many of which are alſo inexplicable.

Thus the *Europeans* have carried the ſmall-pox to almoſt all parts of the world, where their ſhips have opened a trade; though the mariners in thoſe ſhips might not have been afflicted with it in that voyage. This venom has been conveyed, in an old blanket, to nations of *Indians*; ſome of whom it hath almoſt extirpated.

extirpated. It will lie concealed for a long time in contaminated veſtures, ſo as to be carried in them from *England* to the *Cape of Good Hope*, and even to *China*. Now, in moſt countries into which it hath been once introduced, it ſeldom fails to make its appearance at an interval of ſome years, or oftener; except in ſuch places where the ſame precautions are uſed againſt it, as againſt the plague.—By which precautions it hath been often effectually prevented, for many years, from coming among them, both in ſeveral inland towns of *England*, and in many colonies of *Britiſh America*. But though there are the moſt convincing proofs, that this diſeaſe is neither hereditary nor innate, and the higheſt degree of probability, that it can be propagated in no other manner at preſent, than by an infection; yet, during the utmoſt exertion of its force, endeavours uſed to give it to ſome perſons, by their lying in the ſame apartment with the infected, and other methods of a free communication with them, do often prove ineffectual. And ſome of the conſtant attendants about the ſick in this diſeaſe have never been infected.

What is ſtill more wonderful, not only the ſmall-pox and the plague, but other contagions, which I have known to rage in ſhips and in priſons, after exerting their utmoſt violence,

violence, will ſometimes abate by degrees in their malignity, and at length ſtop. Have they exhauſted themſelves, or the ſubject? That they do not always exhauſt the ſubject is plain from facts, and our experience of the thing. Thus, for example, although the infection of the ſmall-pox was pent up entirely in the *Royal George* (as mentioned in my firſt paper) among eight hundred and eighty men; yet this contagion diſappeared altogether at ſea, and ſome months before the ſhip put into any harbour, after having deſtroyed four or five perſons, and left near one hundred unattacked. It had unfortunately been introduced into that ſhip by a boy, who lodged in a houſe where the ſmall-pox was.

The ſuppoſition, that contagion exhauſts itſelf, may be perhaps admitted in ſome plagues; though at beſt it is an *hypotheſis* attended with inſuperable difficulties, and hardly of credit ſufficient to determine a queſtion of ſuch importance as this.

Further, the ſpecific nature and qualities of ſuch poiſons are likewiſe various from each other, and in many reſpects inſcrutable. How far does each extend its proper ſphere of activity?

tivity *? who will undertake to assign an irrefragable, or a plain reason, why the small-pox will infect persons but once during the period of their life; while the plague and other infections attack the constitution again and again? There are unquestionably certain limits prescribed to human researches, beyond which, though fancy may take its flight, and theory make wide excursions, all is conjecture, obscurity, or profound darkness.

* It has been remarked, in many ships, that the men have continued in perfect health, notwithstanding the *bilge-water* in the *hold* was very offensive, nay, highly poisonous. The following accident happened lately in the *Bay of Biscay*. In a ship of sixty guns, by the carpenter's neglecting to turn the cock that freshens the *bilge-water*, which had not been pumped out for some time, a large scum, as is usual, or a thick, tough film, was collected a-top of it. The first man, who went down to break this scum, in order to pump out the *bilge-water*, was immediately suffocated. The second suffered an instantaneous death in like manner. And three others, who successively attempted the same business, narrowly escaped with life; one of whom has never since perfectly recovered his health. Yet that ship was at all times, both before and after this accident, remarkably healthy.

POSTSCRIPT.

Haſlar Hoſpital, Dec. 4, 1762.

SINCE theſe papers were read before the Society, and afterwards reviſed and enlarged, an unwearied attention to this ſubject, together with three years obſervations on fevers, in addition to thoſe related in Paper Iſt. have abundantly confirmed their contents.—And experimental facts, of the moſt public nature, ſtill continue to enforce the truth of the practical doctrines contained in them.

Thus, for inſtance, in the *Royal Sovereign*, a guardſhip at *Spithead*, there has been an infection for two months paſt; and, ſince the 23d of *October* laſt, 97 of her people have been admitted into this hoſpital, of whom 83 were affiicted with the ſhip-fever. Of thoſe four are dead, and all the reſt are recovered, except ſuch who were lately admitted, none of whom are this day in a dangerous condition. This fever hath been accompanied with no ſymptom that can be called malignant, unleſs a greeniſh or bloody diſcharge from the bliſtered parts, and that only in a few. With five perſons the fever continued beyond the ſeventh day. The attack of it was gene-

rally

rally very ſudden, and on ſome with frightful dreams during ſleep.

Although one and the ſame infection, confined to that ſhip alone, be the ſole cauſe of this fever; (as is plain by the healthful condition of the other ſhips now at *Spithead*, whoſe men are taken ill of it when ſent into the *Royal Sovereign*) yet, after the malady has paſſed its firſt ſtage, accompanied with chills, ſickneſs, head-ach, *&c.* the ſymptoms become ſo much diverſified in different patients, that a practitioner, unexperienced in ſuch matters, might be apt to judge ſome of them to labour under a nervous fever, others under a *peripneumony*, or baſtard pleuriſy. Some are coſtive, others have a conſtant purging.—Symptoms, almoſt common to them all, are a low, quick pulſe, a conſtant heat and thirſt, and a perceptible alteration in the eyes.—And it is more than probable, that were any perſons, after having left this ſhip for ſome days, to be taken ill with this fever in a country town, the true nature of their illneſs might not be ſuſpected, and therefore the proper means for their immediate relief might unfortunately be neglected. Of nine nurſes, conſtantly attending thoſe patients, only one has been infected, who immediately became well after taking a vomit.

For ſome years paſt, neither in this hoſpital, nor in this part of *England*, have fevers, altogether inflammatory, been very frequent. Some practitioners give the name of the bilious fever to that which in theſe parts has moſtly prevailed. Now and then the malignant ſore-throat has made its appearance.—Is not this laſt diſeaſe a plague, *ſui generis*, imported, like ſome others, from the *Levant*, and which hath now ſpread itſelf over different parts of *Europe*, and of the *North American* colonies *? Dr. *Tournefort*, in his voyage to the *Levant*, obſerved it above 60 years ago in the iſland of *Milo*: "Where (he ſays) there "then raged a terrible diſtemper, not un-"common in the *Levant*; it carries off chil-"dren in twice twenty-four hours. It is a "carbuncle or plague-ſore in the throat, "attended with a violent fever. This ma-"lady, which may be called the child's "plague, is epidemical, though it ſpares adult "people. The beſt way to check the pro-"greſs of it, is to vomit the child the mo-"ment he complains of a ſore-throat, or "that he is perceived to grow heavy-headed." An excellent advice, which cannot be made

* See extract of a letter from *Cadwallader Colden*, eſq; concerning the throat diſtemper. Medical obſervations and inquiries, by a ſociety of phyſicians in *London*. Vol. 1. p. 211.

too

too public, or too warmly inculcated, for the preſervation of ſuch families as are viſited with this affliction.

That celebrated botaniſt and phyſician, whoſe works of erudition do honour to the *French* nation, in his firſt letter from *Conſtantinople* to the count *de Pontchartrain*, relates, in a few words, what appears to be the moſt judicious preſcription, or beſt remedies, againſt the plague. —— "A vomit (ſays he) muſt "precede other remedies, which is to be re- "peated, according to occaſion, without de- "lay, the moment the head ails any thing, "or the leaſt loathing is felt. If the ſmalleſt "ſpot appears on the body, it muſt imme- "diately be cut and ſcarified, and an iſſue "made with *lapis infernalis*, as ſoon as poſ- "ſible, in that part where the ſtrength of "the poiſon chiefly diſcharges itſelf. Beſides "which, *treacle*, and other cordial medicines, "may be adminiſtered."

I have little further to add, in reſpect to the ſymptoms common to ſuch fevers, as are eminently contagious. The ſpots have been already deſcribed. The yellow colour of the ſkin, which is now and then obſerved, continues ſometimes but 24 hours, often for three or four days. When the bliſtered parts are covered with a tough jelly like leather,

leather, about an inch in thickneſs, and ſeparable from the parts underneath, by means only of a gentle moiſture oozing out from below it, this is a proof of a malignant, and highly dangerous fever. After the ſeparation of that detached ſkin, a ſmaller, tough jelly is apt to riſe. If in the fleſh, under thoſe ſubſtances, there are obſerved white or ruddy ſpecks, a favourable expectation of a recovery may be conceived; but if thoſe ſpecks appear of a pale or dark colour, all hopes of life are vaniſhed. The offenſive ſmell, peculiar to patients labouring under ſuch fevers, continues with ſome after death. A bleeding from the noſe ſometimes happens in the beginning of the diſeaſe, and is, for the moſt part, a ſalutary incident for the patient, but we have ſeldom or ever remarked it towards the cloſe of life. A degree of deafneſs is moſt uſual towards the end of the malady. The firſt obſervation I made on this ſymptom, was in a ward containing 20 patients labouring under a malignant fever, of whom ſix became deaf to a great degree; and of thoſe, three recovered, and three died. But, upon a review of the caſes of above four hundred patients who had this ſymptom, I find it cannot be reckoned to portend death; on the contrary, it hath been moſt uſually remarked in recovering patients.

As

As the pulſe, in thoſe fevers, ſeldom indicates a general inflammatory ſtate of blood, ſo the relief, obtained from bliſtering the parts chiefly affected, might lead us to conjecture, that there was ſeldom any particular inflammation, which would probably be increaſed by the irritation of the bliſter. There ſeems likewiſe no great reaſon to ſuppoſe any great tendency to a mortification; at leaſt in ſome thouſand patients, labouring under ſuch fevers, to whom bliſters were applied, I never remarked a mortification to enſue, but from the neglect of a proper care and treatment of the bliſtered parts, as would have happened in any other diſeaſe.

In Paper II. we have deſcribed a conſumption, as accompanied, for the moſt part, with an emaciated ſtate of the body and limbs; and, in a note to the poſtſcript of the eſſay on preſerving ſeamen, I have there mentioned a very common cauſe of it; to which, in order to procure more care and compaſſion for people in that laſt caſe, it muſt now be added,—That ſuch patients as have been bruiſed, and are frequently ſpitting up blood, or, at other times, what reſembles *matter* or *pus*, do often ſink into death, not much waſted in the fleſh; their looks and appearance not always beſpeaking their dangerous condition.

F I N I S.

Portsmouth Feb 25 1830

Lewis Brackett. Book

Brave Remblefelt
is gone his last sea
fight - is over. & he & his his
8 o. men. Will flow
the waves no more,
they made the vessell
heal & laid her on her
side - a land breeze
shook the shroads &
she was over set down
went the the royalt
George & all her Crew
Complete